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HISTORY
OF

THE MOBILE DISTRICT

U. S. ARMY CORPS OF ENGINEERS

1815 to 1971

MOBILE DISTRICT, SOUTH ATLANTIC DIVISION
CORPS OF ENGINEERS
U.S. ARMY
1975

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U. S. ARMY



MOBILE DISTRICT
SOUTH ATLANTIC DIVISION



COLONEL ANDREW N. DAMRELL
DISTRICT ENGINEER, 1870, 1873 - 1895

The United States Army Corps of Engineers

A HISTORY OF THE MOBILE DISTRICT

1815 to 1971

by

Virgil S. Davis



THE AUTHOR

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FOREWORD

The Mobile District is one of the oldest and also one of the most active districts in the Corps of Engineers. Since early in the 1800's, except for a brief interruption during the Civil War, Army and civilian personnel of the Corps stationed at Mobile or directed from the Mobile headquarters have worked continuously to develop the rich water resources of the area and to build and improve its many important military installations. Their accomplishments have made major contributions to the growth and well being of the Southeast.

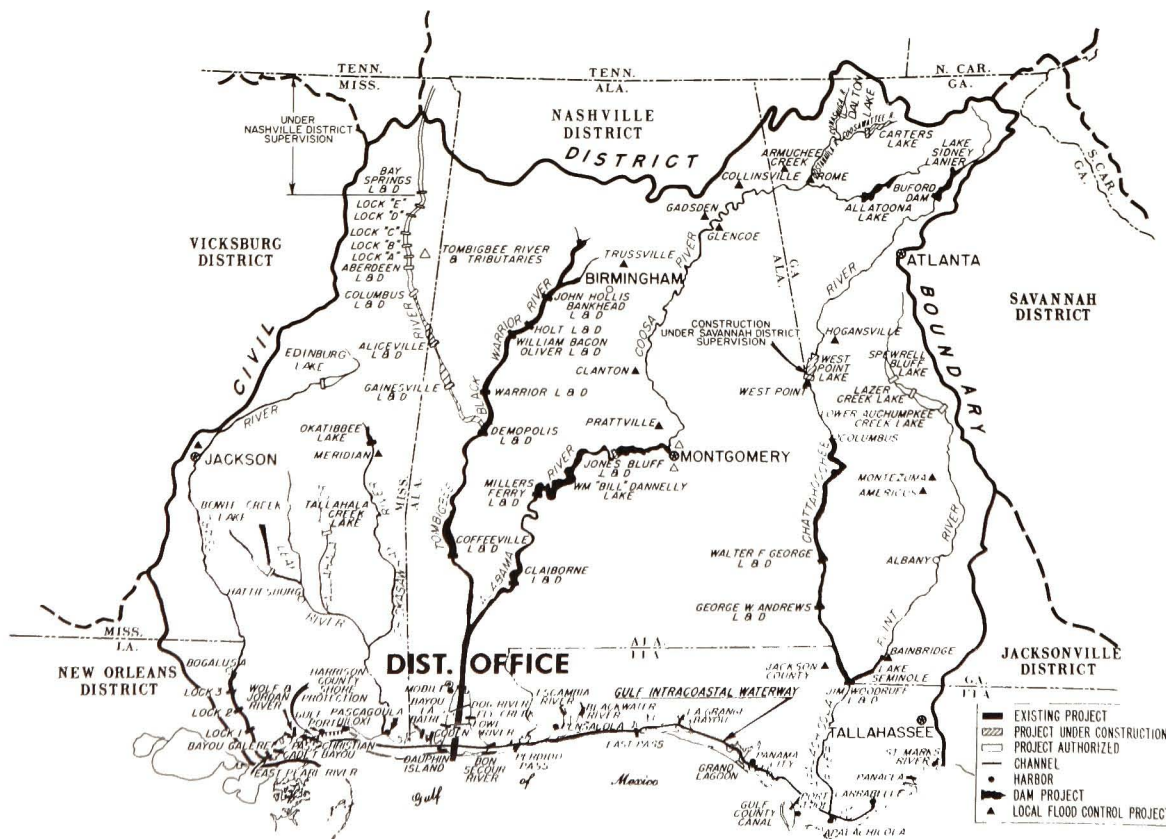
Recording this long and eventful history has been a monumental task. We were most fortunate to obtain Dr. Virgil S. Davis, Chairman of the Division of Social Sciences and Professor of History at Mobile College, to do the job on a contract basis. His diligence in searching out and organizing information from widely scattered sources, his enthusiastic interest in the project, and his ready cooperation with the District Historical Committee have made working with him a pleasure.

A handwritten signature in black ink, appearing to read "Drake Wilson", with a stylized, cursive script.

DRAKE WILSON
Colonel, CE
District Engineer

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MOBILE DISTRICT U.S. ARMY CORPS OF ENGINEERS

PREFACE

This research project is a part of the United States Army Corps of Engineers historical program which proposes to record the history of the Corps since its inception in 1776. This project is limited to that area which became the Mobile District. Work in this area was initiated after the War of 1812. The invasion of New Orleans and attacks on Dauphin Island and Mobile Point by the British revealed the need for a Gulf of Mexico defense system.

Second Lieutenant Hipolite Dumas was sent to survey the Gulf Coast frontier in 1815. This was the first Corps activity in the Mobile District. There were no actual Corps of Engineers districts, as such, at that time. During the early years, the engineer in charge of work on the Gulf of Mexico was assigned projects which often were far removed from that area which became the Mobile District. Engineers operating from offices maintained at Fort Morgan, Mobile Point, Alabama, and at Fort Pickens, Pensacola, Florida, were responsible for projects as far to the east and south as Key West, Florida, and as far west as the Red River in Louisiana. Though the bulk of the projects were located between the St. Marks River, Florida, and East Pearl River on the Mississippi-Louisiana boundary, those did not constitute district boundaries strictly speaking.

Military responsibilities during the period before 1888, the year that the Southeast Division was established, were exclusively coastal defenses. Civil projects were largely harbor improvements with some channel clearing and dredging in the early years. After the Civil War, there was a tremendous expansion of river and harbor work, but almost no military projects until the eve of the Spanish American War.

The Corps of Engineers was reorganized in 1888. With increased responsibilities, the Nation was divided in Corps divisions with a Division Engineer over each. The divisions were divided into districts with District Engineers for each. The District Engineers reported to the Division Engineers who, in turn, reported to the Chief of Engineers.

The Mobile District fell in the Southeast Division, but became the Montgomery District with responsibilities from the Escambia River eastward to St. Marks, and the Mobile District from the Escambia River westward to East Pearl River. This organizational structure remained until the two districts were joined in 1933. The boundaries and responsibilities of the Mobile District did not change significantly again until World War II.

During the months preceding United States entrance into the conflict, the Corps of Engineers was given the responsibilities for all military construction for the Army and Army Air Corps. The Mobile District was further given military projects from the New Orleans, Vicksburg, and Nashville Districts and became one of the largest and most active engineering organizations in the world.

Since 1941 the boundaries of the military district have changed several times. Boundaries which finally became fairly definite extended from the St. Marks River, Florida, to Pearl River in the west and included Northwest Florida, western Georgia, all of Alabama, all of Tennessee, a larger portion of Mississippi with responsibilities extending briefly

into South Carolina and Kentucky. They were further expanded in 1971, however, when military responsibilities of the Jacksonville District were assigned to the Mobile District, and the Canaveral District was phased out and that responsibility was assigned to the Mobile District.

The civil district has remained definite since the joining of the Montgomery and Mobile Districts in 1933. Boundaries are dictated primarily by river systems. The District as it emerged extends from the St. Marks River, Florida, to East Pearl River in the west and includes all the rivers and their tributaries between those points. This includes many harbors and a long coastline with the usual responsibilities for channel, harbor, and beach erosion projects. The District extends inland to include northwest Florida, western Georgia, most of Alabama and about two-thirds of Mississippi.

Beginning with one man assigned to accomplish a coastal survey in 1815, the Mobile District grew until it reached a workload in 1964 greater than that of any other district, and was described as the busiest engineering district in the world. Its responsibilities have extended from the east coast of Florida to the South Pacific in the west and to Panama Canal Zone to the south in the form of special assignments. Projects ranged from minor local flood-control work to playing a major role in landing man on the moon.

This research treats much of the history only in a general fashion. With two hundred or more projects in progress at once, many of which have been multi-million dollar works, time and space would not permit a full treatment.

The author wishes to express appreciation to Colonel Robert E. Snetzner and Colonel Harry A. Griffith, District Engineers during the period of this research for their cooperation. The members of the Historical Committee, Gibson I. Nettles, Chairman, have been patient and helpful. A. J. Chamberlin and his staff in the Public Affairs Office have been helpful and have provided much historical data. W. C. Strain and his staff in the Office of Administrative Services, especially the Records Branch, were a great help. Personal interviews with L. L. Knight, E. E. Peters, T. O. Gaillard, E. A. Drago, W. R. Matkin, George Collier and others afforded first-hand information. Writings of L. L. Knight, A. L. Saylor, William L. Dolive, U. L. Perry, and I. L. Campbell, all Mobile District Corps employees, have also been especially helpful. G. I. Nettles, more than anyone else, has worked with the author and has sought to assure a good history. The criticisms, suggestions, and advice of Jesse A. Remington, Chief Historian of the Corps of Engineers, have been most helpful.

Lieut H. Dumas
Capt of Engineers Sir,

New York May 4. 1815

You will proceed to Mobile and New Orleans and examine the state of the Works and for the defense of those places, which You will report to me, together with the requisite plans and estimates for repairs to place the Works in a permanent state of defense. You will examine Water Course, roads and passages, leading to and from Mobile and New Orleans, and will select positions on which it may be necessary to erect Works for the additional security of the before mentioned places. I wish a good Topographical Map of the Country from Pensacola to Lake Barataria, West of New Orleans. You can correct ~~defence~~ Map, by Your own observation, and particularly note all positions that have Military advantages, including good Air, Water and easy communication. Proceed answering to the following queries. 1st What draft of Water can be carried thro' Lake Ponchartrain into Lake Maurepas, and what natural facilities there are to communicate with the Mississippi from the point of Lake Maurepas nearest the River. The Secretary of War requires You to report to him the means that have been taken to secure, and the preservation of the Artillery and other public property at the several ports and Fortifications in Your district, and also the number of Men that would be necessary on a Peace Establishment to be kept at each Post. - A Copy of the above required report You will inclose to me -

I am Respectfully &c J. G. W. J. C.
(Signed)

CHAPTER I: EARLY WORK IN THE MOBILE DISTRICT

General Joseph G. Swift, chief engineer, expressed concern with harbor fortifications in correspondence with the Secretary of War on 21 March 1815.¹ He reported that he had discussed the matter with Secretary of State James Monroe and had arranged to send officers of the Corps of Engineers to the important ports from Maine to New Orleans. They were to give full reports on the state of fortifications, and, where necessary, select sites for new works to protect the principal positions on the coast and the avenues to those sites.

Swift sent Second Lieutenant Hipolite Dumas, an 1813 graduate of West Point, to survey the Gulf Coast Frontier later in 1815. Dumas was a native of France, and received an appointment to the military academy from Pennsylvania. He became a Captain on 31 March 1819, but resigned from military service in 1825. He died 7 February 1841. Dumas was instructed to accomplish a topographical survey of the Gulf Coast. Right in the midst of his work, however, all surveys and recommendations were ordered suspended until a newly created Board of Engineers for Fortifications could conduct surveys and form its own conclusions concerning the needs for coastal defenses. It is assumed that the work of Dumas was turned over to that board since no report under his signature has been found. He did accomplish extensive surveys, however, because the Board of Engineers cites surveys which it could not have accomplished so quickly. In 1819, the Chief Engineer ordered \$10,000 sent to Lieutenant James Gadsden to be used to settle the accounts of Dumas. Gadsden was able to report on 4 May 1819 that the accounts had almost all been settled.

While Dumas was making his survey on the Gulf of Mexico, changes were being made in the Corps of Engineers. Congress, by joint resolution, authorized the President to employ a "skillful assistant" for the Corps of Engineers. On 29 April 1816, upon recommendation of Albert Gallatin, American minister to France, and Lafayette, General Simon Bernard, a native of France and one of Napoleon's most capable engineers, was select-

ed. Bernard had a distinguished career during Napoleon's reign, but he had gone to Napoleon's aid at Waterloo and stood beside him in that battle. This precluded any possibility of remaining in the French military service under the restored Bourbon, Louis XVIII.

After the final exile of Napoleon, Bernard came to America with Joseph Bonaparte, a brother of Napoleon. President Madison officially employed Bernard 16 November 1816. He was given the salary of a general and accorded the privileges of that rank, but was not given a military commission in the American Army. It was hoped that his position as a civilian would prevent opposition from the already established American officials. This was not to be the case, however. General Swift and Colonel Joseph G. Totten, who later became Chief of Engineers, strongly opposed the appointment.

The War Department attempted to prevent opposition to Bernard. On the day of his appointment, it established the Board of Engineers for Fortifications to be composed of three officers of the Corps of Engineers. Colonel William McRee and Totten were placed on the board with Bernard. This board would prevent Bernard from having direct authority over American military officers.

Because of Swift's opposition to Bernard, he was ordered to West Point to superintend the military academy, to prevent his interference in the activities of the board. In January 1817, Swift persuaded President Madison to relieve him of his duty at West Point so he could supervise the functions of the board. Later President Monroe reassured Swift that his authority superseded that of Bernard, but Secretary of War John C. Calhoun tended to approve Bernard's plans for fortifications rather than those of Swift. The chief engineer became irritated and resigned in November 1818, ending what had begun as an outstanding career with the Corps of Engineers. McRee, appointed a cadet in 1803 from Wilmington, North Carolina, resigned from the Corps of Engineers 13 March 1816. He refused to continue to work with Bernard

when it became evident that Bernard was to have the dominant influence on the board.²

Totten, who had been most vocal in his criticism of the War Department's policy of placing a foreigner in the military establishment, refused to resign. He learned to work alongside or independently of Bernard, and enjoyed a long and distinguished career. He became Chief Engineer in 1838.³ Bernard remained on the board until his resignation in 1831.

The Board of Engineers began the first really general and comprehensive survey of the defense needs of America. It secured many surveys and much topographical data, utilizing the work of the Topographical Engineers whose duties began in earnest in 1813. By an Act of Congress 3 March 1813, eight topographical engineers were appointed along with eight assistants. At the close of the War of 1812, all but two of those engineers were mustered out. An act of 4 April 1816 provided for topographical engineers with the army general staff. They were placed under the Board of Engineers to accomplish general surveys and to collect data for a system of fortifications.⁴

The Board of Engineers started their survey at the Sabine River in the west and worked eastward to the Spanish Florida line at the Perdido River. General Bernard filed a report dated New Orleans, 23 December 1817.⁵ In that report he observed the nature of the Gulf Coast Frontier, gave a list of projected forts, and estimates of expenses of construction. That report became the working foundation for future plans for defense on the Gulf Coast Frontier until the system of forts planned was outdated by technological progress.

The conclusion of the report seems to have been largely the work of Bernard. In later disputes, Bernard alone wrote elaborations on the original report to defend its recommendations. For the purpose of this research, only that portion of the report dealing with the Mississippi Gulf Coast, the Mobile Bay area and the Florida Gulf Coast will be considered. New Orleans, Mobile Bay, and Pensacola came to be treated as a single defense system, so there is, of neces-

sity, frequent references to New Orleans.

When Bernard reported in 1817, he saw five approaches by which an enemy might invade the Gulf Coast. They were the Bayou Teche, Vermillion River Basin, the Mississippi River Delta, Mobile Bay, and Pensacola. The elaborate system of forts planned by Bernard revolved around protection of those approaches from enemy penetration and to insure free communication between those approaches for the mutual benefit of all. Above all else, the Port of New Orleans must be held with free access to the Gulf since it was the only trade outlet for a vast portion of the United States by way of the Mississippi River and its tributaries.

Bernard found two forts already constructed on Mobile Bay. Fort Bowyer had been built by the Americans in 1813 on the western extremity of Mobile Point at the mouth of Mobile Bay. It was a circular battery enclosed in the rear by two curtains and a salient bastion. It was elevated about eighteen feet above the ocean level. Its delineations were well performed and would have been sufficient, Bernard observed, if its only purpose had been to defend the ship channel. Since the enemy could carry on by land, it was too small, and the ramparts of its two fronts were too small and too weak. An enemy could approach to within pistol shot without being seen by hiding behind the bank which bordered the north shore of the peninsula. The walls had been constructed of timber filled with sand. Bernard observed that the beams and thick planks with which it was lined were so decayed that they could be pulled off in pieces. It was deemed of no value and would have to be abandoned as soon as a new fort could be erected.

Fort Charlotte in Mobile was the old Fort de Conde renamed by the British in honor of their young queen in 1763 when the English acquired the territory at the close of the French and Indian War. It was the only fort within the scope of the Gulf Coast survey that was well built. It had been built by the French in 1702. Bernard said that its delineation and relief were far below the degree of perfection which had been attained in the construction of European forts which belong-

ed to its era. It was more than adequate, however, for the purpose for which the fort had been built. It had been a stronghold against the Indians and a refuge for the inhabitants of the community in the event of an invasion by the former. Since serious threat of Indian attack no longer existed, the fort had lost its importance. It hardly defended the west bank of Mobile River and offered no protection against invasion by all the eastern branches of the waterways flowing into Mobile Bay. He concluded that the fort should be retained however, as a depot for the militia and as a place of arms against Pensacola as long as that city continued to be in other than United States possession.

The current state of defense for Mobile Bay necessitated starting from scratch. With this in mind, Bernard sketched his proposed defenses. There were three considerations in justifying an elaborate defense system by the standards of the day. The first was, the protection of Mobile Bay. Second, he saw the necessity of protecting the same area from an invasion from Spanish Pensacola by land. This would be necessary until Pensacola became a possession of the United States, a condition which Bernard considered a prerequisite for the peace and protection of Alabama settlers. The third was the security of the Port of New Orleans. It must be protected from an overland invasion from Alabama, and also a coastal waterway must be kept open between the two ports by way of Mississippi Sound and Lake Ponchartrain.

The Alabama and Tombigbee Rivers join just above Fort Stoddard at present Mount Vernon to form the Mobile River. The Tombigbee had a channel which was navigable for three hundred miles by boats drawing three feet of water. Schooners drawing four feet could go to St. Stephens. The Alabama was navigable to Fort Jackson, a distance of about two hundred miles. This area served some 40,000 population in 1817, and the settlers were increasing rapidly. The quality of the soil and mild climate dictated that it would develop into an area of great economic importance. Further, Bernard accepted it as a matter of course that the Tombigbee and Tennessee Rivers would be joined and Mobile would become the main port of trans-

portation between the Mississippi Valley and the Gulf Coast.⁶

The immediate concern in 1817, however, was to protect the Alabama settlers against the Spanish in Florida and the Indians incited by the Spanish or British. Violence, he said, would not cease entirely until Florida belonged to the United States and until the coastal defenses deprived the Europeans of all means of communications with the Indians. The Indians then could be made dependent upon the United States through commerce.

There also existed a string of islands between New Orleans and Mobile Bay with a natural channel between them and the mainland which afforded a direct line of communication between the two points. It was necessary to protect this line of communication in time of war. It was regrettable that the islands were too far apart to permit a line of forts giving protection to the entire channel. This channel was later utilized as a part of the Intracoastal Waterway.

An enemy landing at Mobile would have access to all areas of the Gulf Coast Frontier by way of roads. Old Fort Stoddard just north of Mobile had been a port of entry before Mobile was acquired by the United States. There was a carriage road from Mobile to Fort Stoddard. There it connected with a whole system of roads which could be used as routes of invasion. The road directly between Mobile and Pensacola was only two or three feet wide and could accommodate only someone on foot or on horseback. It posed no threat at that time, but could be easily widened.

There were roads from Fort Stoddard to Baton Rouge and Natchez, both of which were situated on the Mississippi River. An enemy utilizing those roads could approach New Orleans from the north by way of the Mississippi. There was also a road from Fort Stoddard to Pensacola. It accommodated carriages, but the bridges were in a sad state of repair, and would have to be rebuilt to accommodate any extensive transportation. There was a ferry boat at the Fish River crossing. There was a better road between Pensacola and Fort Montgomery on the left bank of the Alabama River. This was the

road over which Andrew Jackson marched against Pensacola in November 1814. It was the best possible overland route to Pensacola, and afforded the most favorable access to act against that city. It was, however, just as valuable to an invading enemy. Each of the above mentioned roads had great military significance which became increasingly important if Mobile Bay was vulnerable.

With those considerations in mind, Bernard developed his plans for the defense of the Gulf Coast Frontier. The conclusions drawn from the survey of 1816-1817, called for forts at Grande Terre, one on each side of the Mississippi River at Plaquemine Bend, Bayou Dupre, Bayou Bienvenue, Chef Menteur, and the Rigolets Pass, all in Louisiana. The system projected for the Mississippi Sound, Mobile Bay area, included a tower to protect Pass au Heron, a substantial fort on the eastern end of Dauphin Island and one of equal size on the western tip of Mobile Point across the bay. At a later date Fort Massachusetts was built on Ship Island to protect Mississippi Sound though it was not a part of Bernard's system. Bernard foresaw the acquisition of Florida by the United States and commented concerning the necessity of adequate fortifications for Pensacola Bay. When Florida was secured in 1819, the defense system was expanded to include four forts on Pensacola Bay with the protection of the navy yard being the primary consideration.

The value of Mobile Bay, Bernard said, would be enhanced to the United States due to the annexation of Florida. Pensacola, he noted, was the only harbor in the Gulf admitting the largest war vessels then in possession of the United States. James Gadsden stated that peculiar advantages such as a sheltered harbor and a deep channel across the bar dictated that Pensacola Bay must be selected as a site for a naval depot for the Gulf Coast Frontier. While forts could easily protect the ship channel from a sea attack, Pensacola was so vulnerable to a land attack that it was necessary to perfect the defenses of not only Pensacola, but also Mobile Bay. The two bays, he said, were intimately connected and had to be looked upon as a single system of defense in the interest

of security and permanent defense of the contemplated naval depot.⁷

The knowledge of Pensacola Bay was based on a survey accomplished by the British between 1764 and 1771. The survey was made by George Gauld, M.A., under the direction of the Lords Commissioners of the admiralty. The title which appears on the charts describes the scope of the project. It states that it was "an accurate chart of the coast of West Florida and the Coast of Louisiana from the Suwannee River on the West Coast of Florida to 90 degrees 20' West Longitude, describing the entrance of the River Mississippi, Bay of Mobile, and Pensacola Harbor."⁸ In 1825 Simon Bernard referred to a survey of Pensacola Bay which had been made by a Captain Elliot of the navy in 1822. This survey was being used by Major James Dearney of the Topographical Engineers then at Pensacola making a more complete survey. Tampa Bay was also being surveyed as a possible site for the proposed naval yard. Bernard considered it the only possible site which could compete with Pensacola Bay. A survey of Port St. Joe revealed water thirty feet deep and a protected harbor, but other considerations nullified those advantages.

Actual work toward the navy yard was initiated by order of the Secretary of the Navy, Samuel L. Southard, 15 September 1825. He appointed Captains William Bainbridge, James Biddle, and Lewis Warrington to select a site for a naval establishment at Pensacola.⁹ The United States ship "Hornet" under the command of Captain Woodhouse was placed at their disposal for transportation.

They were ordered to assemble at Norfolk, Virginia, on or about 1 October and to proceed to Pensacola as soon as it was convenient. They were to select the site and negotiate the purchase of land subject to approval of the Navy Department, but in the event of urgency, could negotiate final settlement of the purchase. They were authorized to acquire all land needed for current needs and any which might be necessary to meet future requirements. They were provided with a proposed plan for fortifications which would be established to protect the harbor.

Major James Kearney of the Topographical Engineers had recently surveyed Pensacola harbor and a Lieutenant Pinkham had accomplished soundings. The naval commission made its selection for a site for the navy yard on the basis of projected fortifications and the surveys. It settled on a site just north and east of Tartar's Point near old Fort Barrancas. There the water was deepest near the shore and the position was well situated relative to proposed defense structures. Being near Barrancas, it could utilize the assistance of troops stationed there if needed. Tartar's Point afforded complete protection from swells created by southern winds. The land was high, hence healthful. There was also an adequate supply of fresh water. Since the area was public domain land, purchases were unnecessary.

Fortifications on Pensacola Bay revolved around the necessity for protecting this naval yard. An elaborate system of defense was constructed which ultimately included four forts. All were substantial structures with Fort Pickens being the largest. It was not exceeded in size by any other gulf coast fort except Fort Jefferson constructed on Dry Tortugas west of Key West, Florida, at a later time.

The Pensacola defenses were national in purpose from their inception. There was little local population to protect, and no concentration of economic interest. The pine barrens extended from the coast line for some forty miles inland. The area was unsuited for agriculture, and would not support any significant population in an agrarian economy. With the development of the plans for the Pensacola defense projects, the Gulf Coast Frontier system was complete.

Most of the system was constructed, though not on the schedule Bernard had projected. Since the Corps of Engineer districts had not been formed at this time, much of the construction in Louisiana was directed by the officer in charge at Mobile Point. Though the Louisiana forts were located outside the area which became the Mobile District, they are noted here simply as a part of the Gulf Coast defense system. Fort Livingston was constructed at Grande Terre at the entrance of Barataria Bay west of the Mississippi. Fort Jackson was built on the west bank of

the Mississippi at Plaquemine Bend, and Fort St. Philip on the east bank. Fort Macomb and Fort Pike were constructed at Chef Menteur and the Rigolets respectively, and Martello Castle was built at Dupre Bayou. Those forts gave protection to all water approaches to New Orleans. As stated above those forts were outside the Mobile District and their construction, therefore, did not fall within the scope of this research.

Those forts which were included in this research were those along the Mississippi, Alabama, and Florida coasts. Fort Massachusetts was built on Ship Island. Its purpose was to protect Mississippi Sound. Fort Powell, a Martello Tower type structure was built at Pass au Heron to protect the pass from Mississippi Sound into Mobile Bay. Fort Morgan and Fort Gaines were placed in positions to protect the ship channel into Mobile Bay from the gulf.

The four forts constructed to protect Pensacola Bay and the navy yard were Fort Pickens, Fort McRee, Fort Barrancas, and Fort Redoubt. That system of forts gave the Gulf Coast Frontier adequate protection against enemy invasions at the time they were projected. They were out-of-date, however, by the time the last one had been completed.

The system of forts reflected the background, experience, and training of Bernard. He had been trained in the traditions of the great French military engineer the Marquis de Vauban, 1633-1707. Vauban perfected the pentagonal fortifications with bastions projecting at each corner so that there was no length of wall which could not be placed under cross fire from behind ramparts. This system gave reasonable protection against the type of cannon fire utilized in warfare at that time. Though Vauban served Louis XIV, 1642-1715, the system had not been outdated when Bernard arose to prominence during the French Revolution and Napoleonic era, 1789-1815. Bernard had directed the construction of the great defense system of Antwerp, Belgium, during the Napoleonic wars. He brought the best of European national defense know-how to America. Though the system extended from Texas to Maine, only that portion which fell within the Mobile District is included in this research.

CHAPTER II:

MOBILE BAY DEFENSES

Congress acted upon the report of the Board of Engineers by approving the initial recommendations for the coastal defense system. The project was implemented in the Mobile District by negotiating contracts for the construction of forts at the east end of Dauphin Island and Mobile Point.¹ A contract for the Dauphin Island project was signed 17 July 1818 with Richard Harris of Richmond, Virginia. It was a brief contract with no specifications for the proposed fort included. Harris simply agreed to construct or cause to be constructed a fort on Dauphin Island at such a place as the United States by any engineer may direct. It was to be constructed of "such walls, ditches, embankments, buildings, parts, and dimensions, as the said engineer may from time to time prescribe." The contract was signed by Joseph G. Swift, Chief Engineer, representing the War Department and Harris. It was witnessed by George Blaney and C. Vandeventer.

This fort, as proposed by the Board of Engineers, was to be 675 yards in length from the crest of the parapets. Total estimated cost was \$693,292.75. It was to be the same size as the one proposed for Mobile Point, and would be manned by 900 men in time of war and 100 in peace times. There were to be 128 pieces of artillery including six 13-inch and four 10-inch mortars. These two forts, Dauphin Island and Mobile Point, as projected would be exceeded in cost and size only by Fort Monroe, at 2,304 yards from the crest of the parapets and Fort Washington at 835 yards. The other forts of the system were to range from 633 yards for Fort Delaware to the smaller forts at 308 yards.²

The contract called for work to begin on Dauphin Island by 1 December 1818, and to be finished by 1 December 1821. Harris engaged a number of white laborers and made considerable preparations to execute the contract, and arrived at Dauphin Island on 22 November. Though only Harris signed the contract, he is listed along with Nimrod Farrow, a partner, as contractors in subsequent documents. When they arrived, they

found no engineer available to designate the location of the proposed fort, and the work was delayed.

The initial labor force included about seventy-five laborers and mechanics. They were idle until the location of the fort was designated on 22 January 1819. Captain James Gadsden was ordered to Mobile Point by General Joseph G. Swift 22 October 1818. He arrived at Mobile 17 January 1819, and proceeded to Dauphin Island to direct the construction of that fort. He was responsible for construction of the forts at Mobile Point and the Rigolets in Louisiana. He remained the officer in charge of the Gulf Coast Frontier and dispersing official until he was transferred in April 1821.

Before actual construction could be accomplished at Dauphin Island, it was necessary for the contractors to gather a labor force, tools, implements and materials such as bricks, lime, timber, and iron. Mobile was considered to be on the remote Gulf Coast Frontier, and Dauphin Island was somewhat remote from Mobile, being disconnected from the mainland. This necessitated securing a fleet of schooners and building a wharf. General Turner Starke, native of Fairfield District, South Carolina, became the agent in charge of construction and henceforth directed the project. There is no evidence that Harris had ever visited the site of the proposed fort before signing the contract. He was, therefore, totally lacking in information concerning foundations, availability of materials, accessibility of Dauphin Island to the source of supplies, and the availability and cost of labor. When excavations were begun, for instance, he learned that the cost of shoring up the walls was about as expensive as the excavations themselves. This just about doubled the anticipated cost of the excavations.

The corps of white laborers was used during the first year, 1819, in establishing the brickyards, building the wharfs, and otherwise making preparations for the actual construction.

When Harris and Farrow had had time to appraise the situation, they concluded that it was practical to dismiss the white laborers and utilize slaves. The slaves were purchased at attractive prices due to the declined price of cotton. A good field laborer in 1819 was worth no more than \$600 to \$650 and slave labor when hired was only about \$100 per year. Having purchased slaves, however, necessitated the construction of shelter, and providing food, clothing, and other requirements. Dr. Anderson Salie was employed in 1818 and remained as the resident physician for the duration of the construction of the project.

Dr. Salie reported later that there were never less than 150 to 200 laborers actively engaged in the project. Those included some white mechanics, masons, and overseers. It had been estimated that bricks would have to be imported from the East at about \$14 per thousand. It was discovered, however, that excellent clay for brick making existed in numerous localities along the Gulf Coast, and the price proved much less than expected. Brick yards were established on Fowl and Dog Rivers, and all the necessary houses to shelter laborers and equipment were constructed.

General Starke appears to have been efficient. In 1820 he was utilizing the labor of 200 slaves, and was about to increase the force to 300 slaves and thirty white men to meet the 1 December 1821 deadline for completion of the fort according to the contract.

In 1821, Colonel James Gadsden transferred the superintendence of the fortifications on the Gulf of Mexico Frontier to Captain Rene E. DeRussy.³ DeRussy reported that he expected the barracks to be completed during that summer. General Starke had established a brick kiln at Red Bluff on the eastern shore of Mobile Bay from which he expected to secure many bricks. He had family connections on the eastern shore. His nephew, Major Lewis Starke had been under the command of Andrew Jackson in the Florida Indian War. In 1818 Lewis resigned from the military and at the urging of General Starke, remained in the Mobile area. In 1825

he married Louisa Dolive in the Mobile home of Nicholas Weeks. For many years he made his home at Red Bluff on Rock Creek. Later he moved to White Bluff or the Village at the later site of Daphne. Lewis Starke provided bricks for the coastal defense projects. His father-in-law, Louis Dolive, his uncle, Nicholas Weeks, and his brother-in-law, Uriah Blue, were all engaged in brick making and supplied bricks and lumber for the forts. General Turner Starke operated a kiln at Red Bluff using slaves owned by the Harris estate until the death of Starke. Though his only connection with the Dolive family seems to have been through his nephew, Lewis Starke, he appears to have brought the resources of the Dolive family to the disposal of the Corps of Engineers.⁴

DeRussy had under his command Lieutenant E. J. Lambert of the eighth Infantry and Lieutenants H. C. Story, William H. Chase, Frederick A. Underhill, and Cornelius G. Ogden all of the Corps of Engineers.⁵ The Gulf Coast Frontier experienced its difficulties. Lieutenant Chase was resident officer at the fort being constructed at the Rigolets. He reported that a storm 15 September 1821 destroyed a large quantity of materials.⁶ The work at Dauphin Island was moving slower than expected, but by mid-October the barracks had been raised to the first tier of loopholes, and there were about 1,000,000 bricks on hand.⁷ Then, without warning, Congress ordered all work on the Gulf Coast Frontier halted.⁸ The work would not be resumed until additional surveys had been made and a re-evaluation of the defense requirements determined. There was serious doubt about the need for the project on Dauphin Island. The construction of the fort was abandoned.

It appears that the decision of Congress was based on the assumption that the project was larger and more expensive than the situation warranted, and that the contractors would not be able to meet the deadline. It was the United States Government which failed to complete the contractual agreement, however, and this necessitated arriving at what damages, if any, were due Harris and Farrow. The question was in litigation for several years.

In 1825 John C. Calhoun, recently elected Vice President, but still in Monroe's cabinet as Secretary of War, appointed Thomas Swann of Alexandria, Virginia, to head a Senate Commission to determine if Harris and Farrow had failed to carry out the provisions of the contract, and to settle the United States obligations to the contractors. An extensive investigation followed.⁹ Swann's final recommendation was that Congress pay the contractors an additional \$72,747.78 to bring the total expenditures at Dauphin Island to \$424,800.00. The commission further dropped a suit which the United States had instituted against Harris and Farrow and agreed to release all liens and securities held against the property of the contractors except a corps of slaves against which the engineer in charge held a mortgage given by Harris for money advanced.

The above sum proved to have been a total loss. The work was never resumed on this fort. When defenses were finally constructed on Dauphin Island some thirty years later, slaves were kept occupied breaking up the bricks of the original construction to use in place of gravel in making of concrete. General Bernard wrote reports almost annually justifying his original plans for a fort at Dauphin Island, but to no avail.

Construction at Mobile Point was quite in contrast to that on Dauphin Island. It got off to an extremely slow start and was plagued with difficulties. The project was initiated by letting a contract to Benjamin W. Hopkins of Vermont 13 May 1818. The terms were the same as those in the contract with Harris. Records of the early work at Mobile Point have not been discovered, though a voucher dated 30 June 1819 referred to the late Mr. B. W. Hopkins, and noted that the contract had been transferred to Samuel Hawkins. B. W. Hopkins died during the first summer, 1818, of his contract.¹⁰

The contractor could not purchase the necessary supplies and was forced, therefore, to fabricate them. The necessary facilities with which to fabricate materials were difficult to secure. Much delay was unavoidable. Brick yards had to be established and a method of making lime from oyster shells perfected. In January 1820 it was noted that excava-

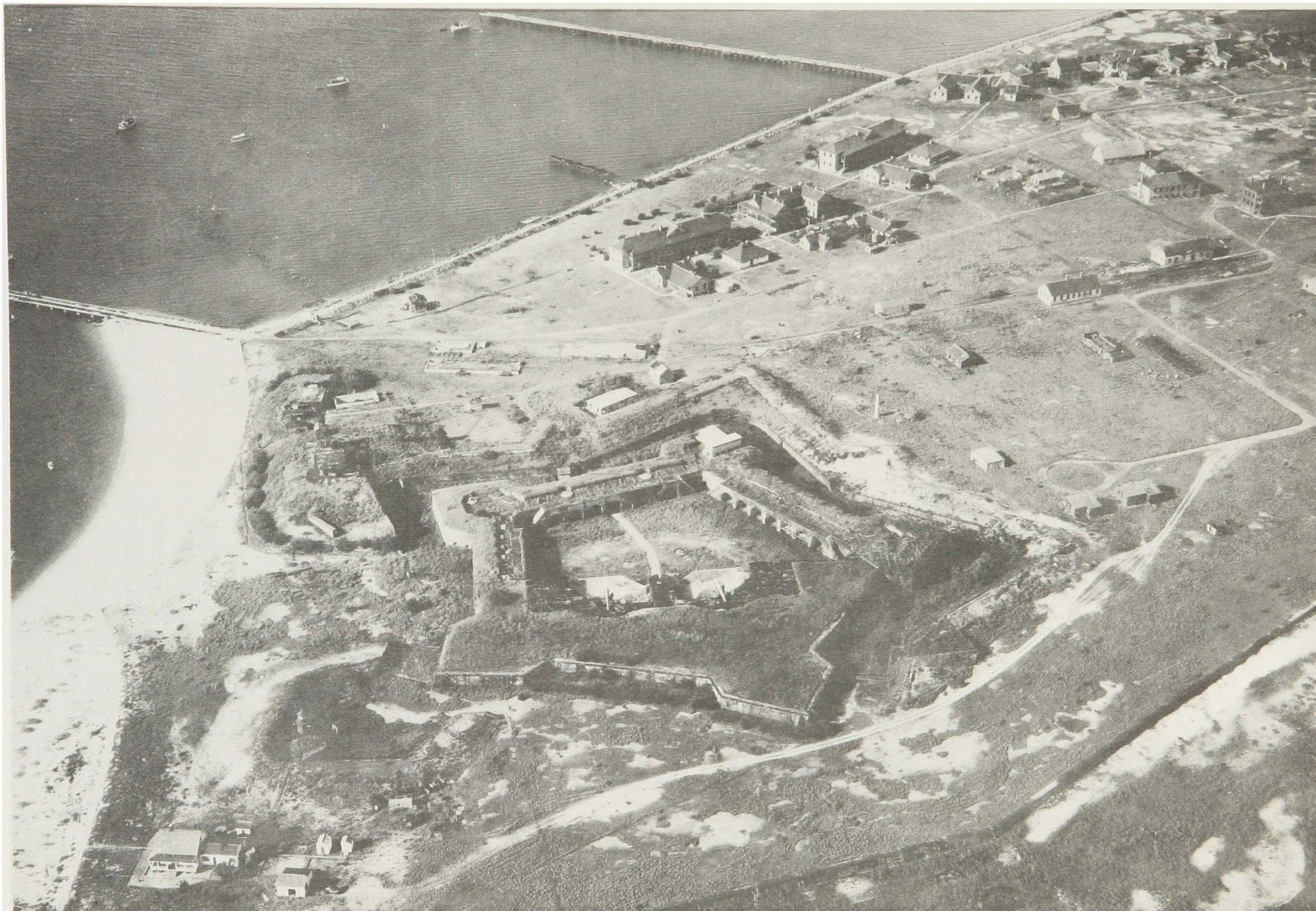
tions had been started but were suspended in order that the entire labor force could be engaged in making or gathering supplies. Brick yards were already operating and were yielding such quantities as to afford an early resumption of the excavations. It was observed 10 February 1821 that the work at Mobile Point was not progressing nearly so well as that at Dauphin Island though the two projects were similarly situated.¹¹

DeRussy gave new direction to the Gulf Coast Frontier defense construction when he assumed direction in 1821. He was a native of the West Indies, and was appointed a cadet in March 1807 from New York. He was cited for gallant conduct at the Battle of Plattsburgh 11 September 1814. His work as officer in charge of the Gulf Coast defenses was directed from Mobile Point, the location of the residence of the engineer officers for some years.

John Bliss was made superintendent of the project. He was receiving bricks in 1819 from Fowl and Dog Rivers at \$9.00 per thousand.¹² Lieutenant E. J. Lambert was engaged in keeping the journals, overseeing laborers, and inspecting materials. Lieutenant Cornelius A. Ogden appears to have arrived at Mobile Point in 1819, but his name does not appear in any prominence until 1823. For a period in 1823 he signed all the vouchers, then DeRussy signed them again until he was transferred in 1825. Ogden was then made engineer officer in charge of the construction of the fort at Mobile Point. He was destined to direct the construction of the fort to its completion.

During the period 1819-1825, when materials were being accumulated, Jackson and Smith Company of Mobile supplied sundry materials. Bricks were purchased from Elijah Montgomery, General Starke, and J. T. Ross. The brick yard belonging to Nicholas Weeks on Fish River was rented for \$250.00 per year, and later DeRussy rented slaves from Weeks to operate the yard. Dr. James F. Roberts was acting surgeon at \$120.00 per month.

DeRussy surveyed the work at Mobile Point upon arrival in 1821 and concluded that it was not practical to continue the contract



FORT MORGAN, AUGUST 1933

with Hawkins. He observed that he had spent five years in collecting materials for fortifications, and concluded that he was more capable than Hawkins in directing the progress of construction. He recommended specifically that the contract not be renewed. The superintending engineer would then be able to obtain materials from a variety of sources, creating competition hence reducing prices. He had already dispatched Lieutenants Story and Lambert with six men to explore possible sources of stone for foundation construction from outcroppings of rock beds on the Perdido River. He had further investigated the prospects of producing lime from oyster shells, which were in abundance at the shell banks on Dauphin Island and near Mobile Point. Lumber was abundantly available, and the price of lumber had diminished in the area by at least one-third since the contracts for the forts had been let.¹³

The Corps of Engineers acquired a fleet of sloops for use at Mobile Bay and DeRussy appealed to the chief engineer to send him professional sailors, noting that they would require good wages and food. They would be continuously employed at Mobile Point. He also noted that he needed a master carpenter and four or five good carpenters, ten laborers, ten quarrymen, and twenty masons. He recommended that the above artisans be used to man the sloops as they were being delivered from shipyards in the north.¹⁴

As the expiration date of the contract with Hawkins drew near, DeRussy sent Lieutenant Story to Washington to try to secure approval of his plan for accomplishing the construction of the forts under direct supervision of the superintending engineer rather than by contract.¹⁵ If the government did not renew the contract, and abandoned the project, and by this time there was serious question about the continuation of this project, as well as the one on Dauphin Island, there was a problem of settling accounts accumulated under the two contracts.

Colonel C. G. Russell, acting as agent for the Hopkins estate, had removed materials from Mobile Point for which Gadsden had paid when Corps officer on the gulf coast. DeRussy forbade removal of other materials, but many other questions presented them-

selves. Among facilities constructed and maintained by the contractor were a brick kiln, a stone quarry, and the lime making facilities at the shell bank. Also there was a question concerning eighty-one slaves upon whom Harris and Farrow had given a mortgage to Gadsden as security for advances made. Those slaves were being retained, but were employed by General Starke at his brick kiln. It came to light that the contractors had also mortgaged a part of the slaves to individuals in New Orleans. A Mr. Cox had, in turn, purchased that mortgage. The complications resulted in litigation which lasted for several years, and doubtless contributed to the decision to place construction under the direct supervision of Corps officials rather than continuing the contracts. There was a period of inactivity during this transition. DeRussy reported to Chief Engineer Colonel Alexander Macomb, who had succeeded Armistead, that work had been completely suspended in December 1821. Foundations of the barracks had been laid and some bricks were on hand, but little else had been accomplished on actual construction.

The work began to progress under DeRussy's supervision. He kept close watch over both quality of materials and workmanship. Slave labor was utilized largely with only certain white artisans and overseers employed. While he personally directed work at Mobile Point, he supervised the work of Lieutenants Story, Chase, Underhill, and Ogden. Story was at Plaquemine Bend on the Mississippi River where Fort Jackson and Fort Saint Phillip were under construction. Underhill and Chase were at Chef Menteur and the Rigolets and Ogden was with DeRussy at Mobile Point.¹⁶ During the years 1822-1824 things progressed slowly but relatively smoothly.

DeRussy proposed to supply his own lime. He negotiated a contract with Calvin Bailey of Boston to supply the lime requirements for the first quarter of 1825. He had finalized plans to manufacture lime from oyster shells by 22 December 1824. Unlimited supplies of shells were available from shell banks on Dauphin Island and on the peninsula between Mobile Bay and the Gulf of Mexico only a few miles from Mobile Point. Those mounds

were an accumulation of shells left by Indian tribes who, for centuries, had visited the sites and eaten oysters. Both banks remain quite large despite the many shells removed during the last century and a half. Since the mounds were privately owned, these shells had to be purchased. The asking price was seventy-five cents per barrel at first, but competition brought the price down. When the contract with Bailey expired, DeRussy was in the shell manufacturing business himself. It was produced from shells at the Dauphin Island shell banks. Hydrolytic cement which was not available locally was secured from New York. The first shipment received was considered to be of very good quality, and DeRussy placed an order for 500 additional barrels in February 1825.

The project received added inspiration in the spring of 1825. During 1824-1825, the Marquis de Lafayette revisited the United States at the invitation of Congress. Congress had voted him a gift of \$200,000 and a large tract of land. His visit brought him to Alabama, where he proposed to inspect fortifications. DeRussy made great effort to be prepared to impress Lafayette. He concentrated on the exterior of the citadel and otherwise sought to improve the appearance of Fort Morgan, the name later given to the fort. DeRussy noted that the elation created by the General's expected visit had had a powerful influence on the exertions of the mechanics, masons, and overseers. He concluded that the fort was ready to receive Lafayette and that the visitor would be highly gratified at the work accomplished. Because of a busy schedule, Lafayette departed Mobile for New Orleans without having visited the fort.

DeRussy became ill and had difficulty recovering. In July 1824 he was temporarily detached from the Corps and Ogden was placed in command of Gulf Coast defenses. DeRussy requested a change of station 6 February 1825 giving poor health as the reason. He was becoming increasingly subject to attacks of fever. He also mentioned a private reason, the painful separation from his child.

Though the records are not clear, it is probable that DeRussy lost the remainder of his family. William H. Chase reported later

that the superintending engineer at Mobile Point had lost his wife and two children and that his own health had been shattered. Since DeRussy never mentioned any other members of his family while expressing great concern for his daughter, it appears that he was the person mentioned by Chase. He had sent his daughter north and it is almost certain that the reason was to remove her from the Gulf Coast climate. DeRussy acknowledged receipt of change of station orders 28 July 1825. He was transferred to New York Harbor. He departed Mobile Point by way of Huntsville, Alabama, since no water transportation was available at the time. A Lieutenant Delafield was left in command of the Gulf Coast defense construction temporarily in the absence of Captain Chase, who was designated superintending engineer. Chase had been recalled to Washington under a cloud. DeRussy did not mention the nature of the cloud under which Chase found himself, but it must not have been serious. He was soon back on the Gulf Coast as officer in charge. Lieutenant Ogden remained at Mobile Point, however, and directed construction of Fort Morgan. Chase was directing construction of forts in Louisiana.

By the time Ogden assumed responsibility for the construction of Fort Morgan, most of the problems had been resolved. The shell banks on Dauphin Island were supplying adequate lime. Ogden kept six men and one yoke of oxen at the site and placed barrels and tools at the disposal of an overseer who directed the manufacture of lime and delivered it to Fort Morgan at a cost of twelve and one half cents per barrel. The oyster shells produced a mortar harder and stronger than that produced from lime stone. It did set too quickly, however, for easy use. Ogden noted in October 1825 that every material necessary for the construction of the fort could be procured on Mobile Bay in any quantity required except stone lime and hydrolytic cement. This was not quite true, but only metal hinges, certain stones and a few other items had to be imported to the area.

DeRussy established the labor policy and Ogden continued it. In the spring of 1825 the rations of the blacks were increased. Experience had taught that the slaves required

more food than the white laborers when the days increased in length, and the interval between their meals became longer.

While Ogden continued the use of hired slave labor under white supervision he did negotiate new contracts with the owners. Since such contracts revealing the nature of hiring slave labor are not generally available, one of those negotiated by Ogden is given in some detail. The Corps had been paying \$240.00 per year for a prime laborer. The owner provided clothing and medical attention. Time loss by the slave was deducted from the agreed wage.

Ogden concluded that the Corps could save \$10,500 per year on labor if the Corps provided the clothing, medical attention, and absorbed the loss of time of the slaves and paid \$200.00 per year for a prime laborer. Cost of medical attention was considered to average \$3.20 per slave. Average loss of time was twenty days per year, or \$12.77. Clothing was placed at \$20.00 per slave, but this cost could be completely avoided by utilizing condemned military clothing.

A contract was negotiated with Robert R. Harwell. All previous agreements with Harwell were annulled. It was then agreed that he would hire to the United States for one year, 1826, the following slaves: Sim, Allen, Nelson, Alfred, Lud, Jamus, Emmanuel, Cain, Solomon, Larry, Sophia, Jenny, Holly, Maria, Rachael, and Thing. The slaves were to work on the construction of the fort at the direction of the commanding officer of engineers. Harwell received full compensation for the labor of the slaves without deductions or drawbacks.

All good able bodied men were hired at \$200.00 per year. The price had increased considerably, since the 1819 recession had largely subsided. All good able bodied women brought two-thirds the price of a prime man, and all boys in proportion to their labor compared with that of men.

Harwell was also given the privilege of sending additional slaves that were new to the construction business and therefore not as experienced as prime hands at the rate of \$175.00 per year, with women getting two-thirds that price. Boys would be valued in

proportion to labor accomplished at the above rate.¹⁷

He also hired slaves belonging to the estate of Turner Starke for \$150.00 per year for the best hands and all others in proportion. Starke had died recently while visiting Cuba for his health. J. F. Ross administered his estate, which was still in litigation concerning a deed and trust held from Harris and Farrow dating back to the suspension of the Dauphin Island project. Similiar contracts were negotiated with the other owners who had slaves employed at Mobile Point.

Lieutenant T. S. Brown was assigned to Mobile Point as assistant engineer in July 1826, giving Ogden much needed assistance. By this time, he had the brick yard on Fish River and those at Mobile Bay under his direct supervision. He also directed the making of lime on Dauphin Island, and scheduled the activities of eight schooners. His greatest energies were expended, however, at the fort, where he sought to keep adequate materials on hand at all times and to direct the activities of the labor force.

In 1826, Government-owned schooners were engaged in transporting bricks, cement, lumber, timber, coal, logs, lime, and cord wood. The project had finally become stabilized, but so had the Mobile area. Ogden requested that henceforth all appropriations be deposited in the Mobile branch of the State Bank, noting that checks written on the New Orleans branch commanded a premium in Mobile. Prices had also become stabilized in Mobile.¹⁸

The labor force had become well established. E. J. Lambert was principal overseer. Thomas Malone was inspector and assistant overseer. Dr. James F. Roberts was surgeon. Vouchers reflecting payments for labor and materials were also made to Lewis Hudson, Edward Webb, James A. Tolbert, Mon Woodrow, and Winslow Foster. Bricks and other materials were purchased from Uriah Blue, Thomas Malone, Elijah Montgomery, Nicholas Weeks, Augustin Lacosta, Louis Dolive, Charles Bingham, and John Jenkins.

One dark spot did appear in 1826. Brazil, a slave owned by a Mr. Sierre, had died while

in the employment of the Corps of Engineers. Sierre secured statements verifying that Brazil had died due to ill treatment. Ogden reported that from the "superabundance" of evidence, death was due to ill treatment, and requested authority to reimburse Sierre for the value of the slave. He stated that Sierre would in all probability go to Congress if the Corps did not reimburse him.¹⁹ Ogden's request was evidently granted. No further reference to the event was noted.

Ogden reported a work force of 202 including himself 1 January 1828. There were 159 laborers of whom 67 were employed making bricks on Fish River, 6 were making lime on Dauphin Island, and 23 were transporting bricks. 4 were hauling lumber. The remainder of the labor force was in administrative functions and skilled labor. Among those were master carpenters, carpenters, master masons, masons, master smiths, smiths, a coxswain, a clerk, an overseer, and an assistant engineer. Records reveal that there was a constant shifting of laborers, but the basic organization remained. Daily reports reflected the arrival and departure of schooners, listing their distinctions and cargoes. The number of slaves varied slightly from month to month. There were 176 slaves 2 February 1828.

A rather ordinary distribution of labor appears in the 18 February 1828 report. There were seven slaves and seven whites engaged in overseeing and superintending the work. Nine slaves and eleven whites were working on the officers' quarters. Six slaves were working on the center of the casemate arches. Twenty-three slaves and three whites were assigned to the casemates. Four slaves and two whites were employed on the gateway arches. Seven slaves and three whites were on the schooners. Twenty-three slaves and one white were receiving materials, five slaves and one white were cooking. Six slaves were making lime on Dauphin Island. Sixty-three slaves and one white were repairing brick yards, preparing wood and coal, burning bricks and cooking and baking for the Fish River brick yard. Weather and other considerations resulted in varying the assigned task from time to time. When windy weather prevented delivery of bricks, those

engaged in transportation were kept busy weaving oakum. This was a loose fiber obtained by untwisting and picking old hemp ropes. It was normally used in calking the seams of ships. Ogden used it to water-proof the roof of the fort.

A typical schooner load of supplies arrived from Mobile 4 March 1828. It contained 660 pounds of soap at eleven cents per pound, sixty-four bushels of beans at \$2.50 per bushel, and 380 gallons of vinegar at forty cents per gallon. There were three bushels of salt at seventy-five cents per bushel, one hundred pounds of candles at twenty-four cents per pound, ten barrels of prime pork at \$12.48 each, and 407 gallons of whiskey at thirty cents per gallon. Five large files were included at \$1.25 each and fifty pounds of chalk at six cents per pound. The drayage and wharfage for the cargo was \$5.81. A cargo of a different type arrived 10 March. The sloop *Cousin* arrived carrying a cargo from Charles Bingham and Company of Mobile. It contained fifty pairs of shoes at one dollar per pair 153 yards of domestic plaid at twenty cents per yard, and 117 yards of white sheeting at fourteen cents per yard. Included were 133 bushels of hair at 62½ cents per bushel, six kegs of white lead at \$4.25 per keg, and one keg of nails (141 pounds) at 10 cents per pound. There were also six cast steel smooth files at \$4.00, one dozen sheets of sand paper at fifty cents, and ten pounds of glue at fifty cents per pound.

Despite the fact that the work had become stabilized generally, there were still problems and set-backs. March wind and thunder storms damaged 15,000 unfinished bricks 11 March 1828 at Fish River. The next day lightning struck the signal staff about 10 feet from the door of the officers' quarters and broke nearly every pane in the windows and destroyed some of the sashes on the north side of the structure. Stormy weather 4 April cost two lives. A gale blowing from the north caused the Corps-owned sloop *Cousin* to founder at her anchor. The sloop *Ann* foundered at her anchor loaded with bricks from Elijah Montgomery's brick yard. The two lives lost were those of laborers seeking to secure the sloops.

Ogden became ill in April and a Lieutenant Tuttle was assigned to Mobile Point to direct construction of the fort. Shortly after his arrival, he proceeded to Mobile with the slaves of the estate of Turner Starke. Their contractual employment had terminated. Upon arrival in Mobile, Tuttle was prevailed upon to retain half of the slaves and let them work for their subsistence. The owners could not conveniently dispose of all of them at once. Tuttle was authorized to use them until the estate called for them. They were delivered to Blakely on 4 June. Ogden returned from sick leave 3 May 1828, but Tuttle was not transferred from Mobile Point.

The corps of slave laborers was reduced to only 123 later in 1828. Thirty-three whites brought the total force to 156. The work on the fort had become somewhat routine. Ogden was placed in charge of a project to deepen the pass into the Pascagoula River, deepening the channel through Pass au Heron between Dauphin Island and Cedar Point, and deepening the Mobile Harbor. The number of men assigned to the Corps of Engineers had not kept pace with the work assigned, and the money appropriated. For the next decade there was a serious manpower shortage, which hampered the accomplishments of projects for which appropriations were made by Congress. John H. Eaton, Secretary of War, in his annual report to the President in 1829, recommended that the Corps be enlarged to accomplish all the Government's internal improvement projects as well as facilities for National defense. He observed that the Corps was sadly deficient personnel-wise to accomplish its tasks and to meet the demands made upon it by the various states. In the absence of civil engineers, states were calling upon the Corps of Engineers for assistance, but were being denied because of the lack of manpower.

To assist Ogden, Captain Daniel W. Gibson was assigned to the project for the improvement of the Pass au Heron. A Major Broom was assigned to the project to improve Pascagoula River.

The work at Mobile Point gradually tapered off as the fort took shape. Records have not been preserved from May 1829 - June 1830, but there is no evidence of any major

changes in policies or procedures. Purchases now were from Dobson and Williams of Mobile rather than Charles Bingham and Company though some of the slaves of Bingham were still employed. The June 1830 roll listed two runaway and two sick slaves. The runaways had returned by 27 July, one of his own accord.

The most serious health problem at Fort Morgan was an epidemic of influenza in February 1831. This was not as serious as it might have been considering the close relationship of the labor force. On 8 February, there were twenty-one ill and the number had climbed to twenty-seven by 10 February. It gradually declined thereafter until only three were ill on 26 February. That day, Enoch, a slave belonging to Charles Bingham, died, but the next day only one was on the sick list.

The force at Fish River was moved to Mobile Point 19 June 1831. There were about enough bricks on hand to complete the project. The hot summer weather did bring an increase in illness, however. The daily report listed from ten to seventeen ill daily during the latter part of June. By 13 July it had climbed to twenty-three. This time the illness was due to scurvy. A hospital was maintained for the sick, and the resident physician, Dr. Roberts, was in attendance. Periodically a slave would be discharged and sent home, usually to Mobile, for the benefit of his health. Such included one belonging to Weeks, two to E. L. Lambert, one to a Mrs. Walton of Pensacola and one to R. R. Hammel. Hammel's slave recovered his health and returned to Mobile Point in August. In October the ill still stood at ten to eighteen and some were still being discharged because of their health.

The labor force increased in 1832. In April, there were 163 slaves and a number of whites. In July the total force stood at 199. By April, 1832, lime production on Dauphin Island had ceased. After a peak force in July, the number was reduced. By 1 August 1833, there were only 68 slaves. The total force stood at 95, ten of whom were ill. Gradually the remaining slaves were discharged. The largest single batch was ten

belonging to Walton and Walton of Pensacola. The fort, now considered complete for all practical purposes, soon had only twenty persons on duty. Nine were slaves. Others were Ogden, superintending engineer, one assistant engineer, one clerk, one store keeper, a coxswain, two carpenters, and two blacksmiths. Two persons were not identified.²⁰

Though the Corps of Engineers continued to be active at Fort Morgan, the major task was complete. Lieutenant Ogden turned over all property belonging to the Corps of Engineers to Captain Chase in May 1834, having received transfer orders. In the absence of a resident engineer at Mobile Point to replace Ogden, he placed the machinery being utilized at Choctaw Bar under the authority of the City of Mobile. Arrangements were then made to sell all perishable property. Any balance of previous appropriations left on hand, he turned over to Chase. When Chase assumed responsibility for the project, he praised Ogden for having discharged his duties faithfully and effectively at Fort Morgan. Difficulties due to the failure of contractors to carry out their agreements had delayed completion and had increased expenses, but the final product was admirable. Chase observed that Ogden would leave the Gulf Coast with the respect and esteem of all with whom he had been officially, or privately, connected.²¹

By 1834, the War of 1812 was far behind. Europe was enjoying one of its longest periods of general peace following the Treaty of Vienna, 1815. Possibility of war seemed remote. The South was in one of its periods of peak prosperity as the cotton kingdom matured. Energies were being expended in the acquisition of land and slaves. Alabama was forgetting its disappointment over suspension of construction of the fort on Dauphin Island, and demonstrated little interest in the fate of Fort Morgan.

Little note was taken, therefore, when Fort Morgan was designated the rendezvous for the Creek Indians preparatory to their removal to the West. The fort was occupied by a large party of Indians about 10 March 1837. The slopes surrounding the walls had been carefully covered with clay and sodded to keep the sand in place. The Indians stripped

the sod away and used the clay for making pots and cooking utensils. They cut some 200 pines and other trees which had been reserved as a wind break. Now the sand was subject to shifting. Several outbuildings were destroyed, but they were already in a state of advanced decay, and therefore had no particular value. The fences were chopped and used as fuel. The gates of the fort were constructed of cypress and were massive and costly. Lead sheathing with which they had been topped had been removed and the gates otherwise damaged. Captain F. S. Belton sent by the Chief Engineer to inspect the fort in 1837 stated that he was not absolutely sure that this was the work of the Indians, but the sheathing was gone nonetheless. Great damage had been done to the quarters. Pumps in three wells had been irreparably damaged.²²

Two years later the damage was still evident. Gullies had washed in the embankments and sand had blown in and filled portions of the ditch around the fort. The glacis had shrunk in their dimensions and stood in need of repairs. The fort was desolate and had a generally unkempt appearance, and this only a few years after completion. Chase, visiting Mobile Point from Pensacola, was able to state, however, that the walls were in good condition. There were few cracks. The quarters, store rooms, and citadel required but slight repairs. The wharf was entirely unfit for use. Estimated cost of repairs was \$10,300.²³

Despite many attempts to update Fort Morgan, it was probably never as adequate as a defense facility again as it was in 1834 when first completed. The only time in its history that it was actually utilized in actual war was the Battle of Mobile Bay in 1864, and, of course, it proved inadequate.

Congress made no appropriations for coastal defenses in 1835. Fort Morgan was not garrisoned, and as noted straight way fell into decay. The forts on the Gulf of Mexico were surveyed in 1838 to determine their state of repair and the sum required to place them in a state of efficiency. Fort Morgan, along with others, had never been garrisoned and there had been no continuous upkeep. It was found in a dilapidated state.

Nothing came of the survey. Another was ordered during the winter of 1839-40. It was less hurried than the previous survey and a more minute report was submitted along with estimated cost of repairs. This report did result in an appropriation in July 1840 and slow progress was made toward repairing and updating the fort.

Two additional forts were ultimately con-

structed on Mobile Bay, rounding out the system as recommended by Bernard. Fort Gaines was constructed on the eastern end of Dauphin Island at the site of the project which was abandoned in 1821, and Fort Powell at Pass au Heron. Those projects were incomplete when the Civil War erupted in 1861 and were completed by the Confederates. They will be discussed later.

CHAPTER III:

THE PENSACOLA DEFENSE SYSTEM

Congress had settled the location of the naval base at Pensacola, Florida, by 1826 and requested that fortifications to protect the installation be initiated within the year if possible. Macomb, Chief Engineer, felt that surveys were not sufficiently complete to justify the commencement of fortifications without possible injury to the projected naval yard. The plans for the structures had not been completed nor their exact location decided. Macomb could not give the impatient Congress a projected date for completion. He did place Pensacola among the most important projects of the Corps, and felt an early accomplishment of the work was justified. He asked Congress for an appropriation for the construction of wharves and a house to be commenced as soon as exact sites could be settled.¹

Macomb instructed the Board of Engineers to project plans and prepare estimates for the fort to be erected on the western extremity of Santa Rosa Island in 1826. The Board expected to have plans ready by January 1827. It was estimated that this fort, later named Fort Pickens, would be erected on that site though the location or exact nature of works on the mainland could not be projected until the naval base plans had been completed and the Corps had had time to study them. The Board of Engineers visited Pensacola in 1827 to finalize their plans.² The overall plan for Fort Pickens was completed early in 1827. It was to be a work of considerable magnitude and importance. The plan called for twenty mortars and twenty-eight cannonades with a total of 200 guns. Provision for a garrison of fifty men in time of peace was projected with the number increasing to 600 in time of war and 1,200 in the event of siege. Estimated cost, including materials, was \$650,000. Macomb requested, and received, a \$50,000 appropriation from Congress to get the construction of Fort Pickens under way in 1828.

This fort was considerably larger than Fort Morgan and the projected fort on Dauphin Island which had been abandoned. They were each to be garrisoned with 900 troops in time

of siege and 100 each in time of peace. Fort Pickens, then, was planned on a considerably larger scale.

Captain William H. Chase of Massachusetts was assigned to Pensacola to direct the Pensacola harbor defenses in 1828. Though Chase was unhappy on the Gulf of Mexico Frontier, he was destined to make Pensacola his home. He retired there in 1856 and died at his plantation home, Chasefield, at Warrington 8 February 1870. The climate proved more healthful than he had anticipated. He was the first West Point graduate assigned to the Mobile District to make the deep South his permanent home. Many others followed his example in the future.

Chase came to Pensacola better equipped to accomplish his task than any other person to have attempted construction in the Mobile District. He was assigned to New Orleans in 1820, and directed the construction of Fort Pike at the Rigolets for the next two years. He then constructed Fort Jackson, 1822-24. Those were the forts designed to defend New Orleans from attack by way of the Mississippi River and Lake Pontchartrain. Chase was then assigned to duty in Massachusetts temporarily, but returned to Louisiana where he directed construction of defenses at Chef Menteur, Bienvenue, and Bayou Dupre. He remained there until assigned to Pensacola in 1828, but he had been exposed to the most unhealthy situation on the Gulf Coast Frontier. The high windswept sand beaches of Pensacola were to be nothing compared to the humid, fever infested marshes of southern Louisiana. He had also acquired experience in defense construction, but, more important, he had made contacts which were to relieve him of tremendous burdens as he tackled the Pensacola harbor defenses. The defense facilities constructed under his supervision were expanded to include all four of the forts in the Pensacola defense system. An assignment which Chase had hoped would be of short duration lasted for nearly thirty years.

Upon his arrival at Pensacola, Chase surveyed the task before him and was able to convince Jasper Strong and his partner George R. Underhill to come to Pensacola with their labor forces.³ Underhill and Strong had been employed in Louisiana for several years, and had developed both the facilities and the capability required for the Pensacola project. Chase found that by leaving the responsibility for the slave labor force completely in the hands of the owners, the United States could be relieved of the responsibility and save money at the same time.

Masonry was constructed at \$8.70 per cubic yard, and payment was made quarterly. Excavations were accomplished at 15 cents per cubic yard. Chase observed that the above prices were more economical than the Corps could accomplish by doing the task with hired labor. Underhill and Strong assumed responsibility for sheltering as well as clothing and boarding the slave labor force. This also relieved the Corps of numerous responsibilities. As a result of this arrangement, the labor force and problems pertaining to it were seldom mentioned in the records.

How many visits Chase made to Pensacola from Louisiana before moving there is not clear, but he made his home at Pensacola by 1 July 1829.⁴ He was assigned as superintending engineer for construction of Fort Pickens and commanding officer or senior officer of the Corps of Engineers on the Gulf of Mexico Frontier. His area extended from Red River in the west to the Apalachicola River in the east. Those under his supervision were Ogden and Lieutenant Washington Hood at Mobile Point, Alexander H. Bowman at Dupre Tower in Louisiana, and Dr. W. McMahon at Santa Rosa Island. Major General Alexander Macomb, who had been chief Engineer since 1 June 1821, was succeeded by Brigadier General Charles Gratiot as Chief 24 May 1828.

Chase submitted a memo to Gratiot 1 October 1829 in which he reviewed the necessity for the "expensive" fortifications at Pensacola Harbor and stated reasons why

they should be completed at the earliest possible date.⁵ The primary reason for what was developing into a rather elaborate system of defense of the harbor was the decision to locate the navy base there, but that was not the only reason. Chase insisted that the proximity of the Mobile and Pensacola Bays necessitated reciprocal defense facilities. The defense of one could not be perfect without the defense of the other. To leave either bay vulnerable would be a threat to the security of the other, and even the very rich Mississippi Delta country. He noted also that Pensacola Harbor was the only one on the Gulf Coast which was both deep enough and sheltered enough to afford an enemy a safe refuge so that a fleet could be refitted in safety. He argued that forts under construction and projected at Key West and the Island of Tortugas would not remove the necessity of adequate defenses for Pensacola Harbor.

Fort Pickens, the first fort of the Pensacola defense system, was to be constructed of brick. One of the first tasks was to find a source of supply. Since Chase could not secure quality bricks at reasonable prices locally, he turned to the Mobile Bay yards as a source of supply. Ogden at Fort Morgan had found it necessary to suspend purchase of bricks during 1829, and when Chase approached the Mobile yards they had about 1,500,000 bricks on hand. Chase purchased bricks from the yards of Major Elijah Montgomery and Uriah Blue on Mobile Bay. He could transport the bricks to Pensacola and still save money because of the high prices charged by the Pensacola yards. He also secured better quality bricks. It did not take long for the Pensacola yards to accept the challenge and begin to produce quality bricks at reasonable prices. Not many orders were placed with Mobile yards. The last was on 4 July 1829. Chase ordered 500,000 bricks from Blue's yard, but indicated that he could not pay for them until the next year's appropriation had been made. He then informed Blue and Montgomery that they would no longer compete with the Pensacola yards because of the distance their bricks had to be transported. His purchases from the Mobile Bay area had served his purpose, however, as the Pensa-

cola yards had begun producing quality bricks.

Hydrolytic cement was ordered from W. E. Lawrence of New York on an experimental basis. An order for ten casks was placed 15 September 1829. If the cement set under water as Chase hoped, additional orders were promised.

Lime came from Thomastown, Maine, where it was produced from limestone. There was an abundance of local sand, which because of its purity produced a very hard cement. Lumber of superior quality could be secured locally in unlimited quantities.

The site selected by the Board of Engineers for the location of Fort Pickens, the projected fort on Santa Rosa Island, was on the south beach of the island. The north beach was constantly exposed to strong currents which might endanger the fort while the south beach tended to increase. Excavations for the foundations were begun under the direction of Lieutenant Alexander H. Bowman in June 1829. About seventy laborers were employed in June with intentions of increasing the number considerably during the last quarter of the fiscal year, July-September. The intense heat reflecting on snow white sand prevented maximum performance during the summer months. As fall approached, weather would be more conducive to productive labor.

By 1 October 1829, foundations on two fronts had been laid. The foundations of two casemates were complete and walls raised about four feet high. The ditches on two fronts had been almost completed. Quarters for the engineers were complete, and the superintendent's house was almost complete. Chase expressed hope that Congress would appropriate funds to enable completion in four years. Climate made it possible to continue construction year round, thus increasing the rate of completion of the project. The original estimate of the fort was \$650,000 and appropriations through fiscal year 1829 were \$125,000.

It was important to Chase to complete the

project as soon as possible. He observed that exposure to the unhealthy climate to which the officers of the Corps of Engineers were subjected in the discharge of their duties endangered their lives. He was convinced that no officer of the Corps could serve on the Gulf Coast Frontier as long as four years without great injury to his health. To prove his assertion he related some facts.

The loss of life and health of the employees at the several engineering positions on the Gulf of Mexico Frontier gave melancholy evidence of the unhealthfulness of the climate. At the Rigolets, Chef Menteur, Dupre Tower, and Bienvenue, Chase recorded the deaths of one contractor, one clerk, one surgeon, a master carpenter, an officer of the Engineers, an officer of the garrison, and at least half of the laborers and mechanics during the past ten years. Chase himself had sustained fourteen attacks of fever. At Fort Jackson on the Mississippi River an officer of the Engineers, the wife of another officer, a clerk, three officers of the garrison, one soldier, and many laborers attached to that station had been severely attacked. At the Mobile Point and Dauphin Island the wife and two children of the superintending engineer had died of the fever and the officer himself suffered severe attacks. Two superintendents and three contractors had also died. He did not note the number of laborers and mechanics who had died on those projects.

Chase submitted the information to the Chief Engineer in an effort to secure appropriations for continuous accomplishment of the projects. It was desirable that all works located in those unhealthful positions be completed in the shortest time possible, especially when it could not be a matter of great concern to Congress whether construction be accomplished in four or seven years, he said.

Less than two months after he related the need for haste in constructing the defenses, Chase found the work at Santa Rosa Island at a standstill temporarily. The Board of Engineers had not forwarded the plans to him. He had gone as far as he could with the foundations and walls until he knew what

was to be constructed upon them. The masons were idle and the forces of Underhill and Strong were without employment. To make matters worse, this was winter and the very best season for work on the Gulf Coast. The weather was mild and less subject to gales and rains.⁶

While work was slack at the fort, Chase spent time in studying old charts of surveys of the channel and making plans for deepening it.⁷ He reported that construction already had been begun on the naval base, and reaffirmed his convictions that Pensacola was the only harbor on the Gulf of Mexico suitable for such a facility. He expressed great satisfaction that the naval arsenal was being established in conjunction with rising interest in the Southwest, and at an early date in the development of the country before sectional conflict of interest or personal opposition had developed.

The bar at the entrance to Pensacola harbor was the only impediment to its importance as a naval base, and his investigations revealed that the obstruction could be removed with little difficulty. He utilized the charts of surveys accomplished by the British shortly after they occupied the harbor following the Treaty of Paris, 1763. Those charts were compared with those by the Corps of Engineers in 1822 and with some which he had just made. Those investigations revealed that the depth of the water on the bar had not changed since 1764. The currents had kept the bar swept to a constant depth, and it was reasonable to assume that if a channel were cut across the bar, the same currents would keep it swept clean.

The largest warship of the day only drew twenty-four feet of water. Chase proposed that a channel twenty-seven and one-half feet be dredged across the bar to a width of one hundred and thirty yards. Dredging machinery capable of this task was already operating at Nantucket. The feasibility of the project was evident by the success of the Nantucket project. That project involved the removal of obstructions more difficult than the Pensacola Bar. In order to accomplish the channel it was necessary to dredge

an average of three feet with the range being from six feet at the shallowest point on the bar to 0. An estimated 1385 yards of sand would have to be removed. He proposed that the channel later be increased to 260 yards and maybe even to 390 yards wide to accommodate a fleet.

Chase had employed the Schooner *Elizabeth* and a Captain Forsyth to assist him in the survey of the harbor. They also surveyed all the channels and islands between New Orleans and Pensacola for the purpose of charting a course without the necessity of taking to the open water of the Gulf. He determined where lighthouses and bouys should be placed between Lake Ponchartrain and Mobile Bay.

In the spring of 1830, Underhill died. Chase did not record the cause of death, but he did note that it was necessary to increase prices paid Strong because of the illness of so many of his slaves. Chase stated that the cause of excessive illness was the exposed conditions under which the slaves had to work on Santa Rosa Island. To add to his difficulties Dr. McMahon was transferred to Tampa Bay. Chase requested his return, observing that the commanding officer at least should have a surgeon attached to his station.⁸ It is not difficult to understand Chase's feelings on the subject when it is recalled that he had spent nearly ten years in the Louisiana marshes and had seen so much illness and death.

During 1830, the work on Fort Pickens tended to become routine. Chase now had the completed plans for the fort and the brick yards were producing quality bricks. Chase found that the local clay made extremely hard and durable bricks when manufactured properly. The labor force of Jasper Strong was very efficient and Strong's work was altogether satisfactory to Chase.

The bulk of the lime used still came from Thomastown, Maine, though some was purchased from other places. He did contract to purchase no more than 10,000 casks from a Captain Richard Spear in 1831 but did not note the place.

There was one incident which caused Chase major concern during 1830.⁹ There was a rumor that Congress might not make an appropriation to continue the defense projects. Chase thought the prospect of not getting additional funds sufficiently serious enough to make some rather specific plans. The balance in the budget from old appropriations would be used to work up all perishable materials. This would leave on hand only about 1,000,000 bricks. Those he could use to pave the parade embankments to prevent the drifting of the sand.

Though he would regret the suspension of the work in its unfinished state, the United States would suffer no loss other than the delay of the defense of the harbor. Houses and quarters could be utilized if work was resumed in the future. In the event work was not resumed, he suggested that the buildings might be occupied by soldiers which Chase recommended be stationed there. A battery which would hold thirty-six guns had been completed. With the erection of earth breastworks, a position would be invincible with the aid of guns already established at old Fort Barrancas across the Bay.

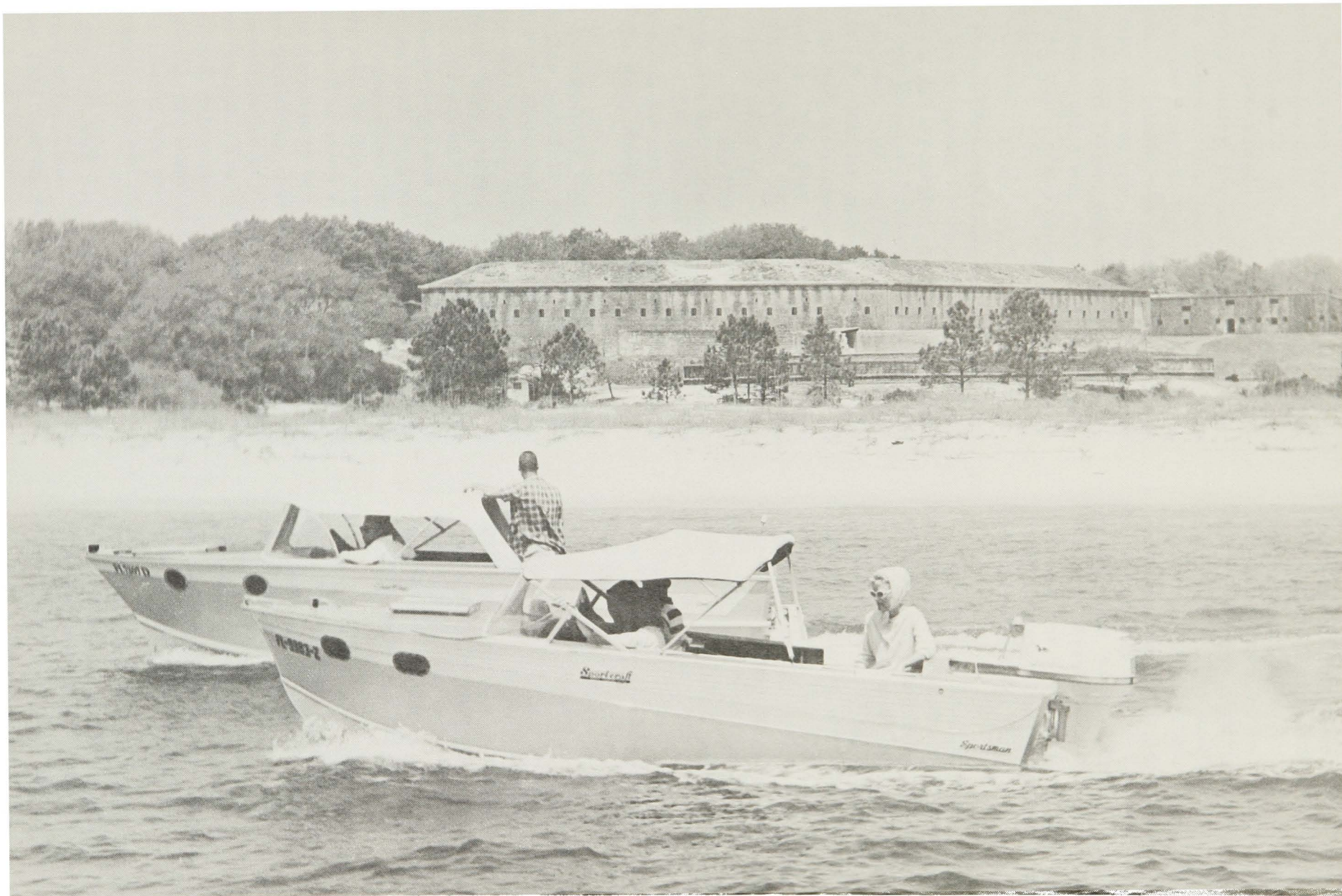
His primary concern, however, was for Strong. He had not accomplished enough work to receive sufficient reimbursements to cover the initial cost of getting his labor force transferred from Louisiana and established in new quarters and getting his equipment transported to the site. The construction of houses for the slaves and his own quarters would prove a dead loss. The terms of the agreement with Underhill and Strong was on a year to year basis, and the contractors had no protection in the event an appropriation was not made in any given year or the appropriation was too small to justify the scale of operation to which Underhill and Strong had established their labor force and equipment. Chase suggested that the Corps of Engineers could purchase and utilize any structures which the contractors had built, thus preventing loss to them. The appropriation was made by Congress, but the incident reflects the concern of Chase to protect both the interest of the United States and that of the contractors. This quality of his person is

what endeared him to the local population and enabled him to retire in Pensacola as an honored and respected citizen.

The summer heat of 1831 caused the fever attacks to return to Chase, and he left the Gulf Coast in the hopes of improving his health. He made his quarterly reports from Stanton, Virginia, in August and proceeded from there to Philadelphia. He kept in touch with Pensacola through correspondence.¹⁰ He noted the first of October that Fort Pickens had an adequate supply of bricks. Ten cubic yards of bricks had just been delivered and there were 3,000,000 already manufactured at the ten brick yards then supplying his requirements.¹¹

By 1831, the Board of Engineers had finalized their plans for the overall defense of Pensacola harbor. A fort was to be built across from Fort Pickens on a neck of land, Foster's Island. It would place any enemy ship entering the harbor in a direct cross fire between Fort Pickens and the new project, which was later named Fort McRee. Old Fort Barrancas was to be repaired and updated and a new fort built 1500 yards to the rear of Fort Barrancas to give it protection from the land side. This fort was named Fort Redoubt. Chase knew that the two new structures projected along with elaborate modifications and enlargement of Fort Barrancas were going to require many additional bricks. He also recalled with what difficulty he had gotten the production of quality bricks established on Pensacola Bay. He requested, therefore, an additional \$50,000 be included in the annual estimates of operating costs of the Pensacola harbor defense projects in order to purchase the required bricks and thus keep the yards operating. He proposed to purchase and place on the site the bricks needed for the construction of Fort McRee first, then meet the requirements of the other sites.

The brick work at Fort Pickens was completed during September 1832, and the remainder of the work would proceed as funds permitted under a more limited 1833 appropriation. Fort Morgan at Mobile Point was also nearing completion, and Chase observed



OLD FORT BARRANCAS AS IT APPEARS TODAY TO BOATERS
ON THE GULF INTRACOASTAL WATERWAY

that neither had been named. He suggested names for the forts, but his proposals were not accepted.¹² The fort on Santa Rosa Island was named in honor of Brigadier General Andrew Pickens of South Carolina, who defended the South from the British during the American Revolution. The fort on Foster's Island was named for Colonel William McRee, who, along with Generals Bernard and Totten, served on the Board of Engineers which was responsible for initiating the Gulf Coast Frontier defense system plans.

Though Chase must have been disappointed that his proposals for the naming of the forts had not been accepted, he was encouraged that the Board of Engineers authorized him to proceed with construction on Foster's Island. Neither the plans nor the location of a site had been approved by the Board of Engineers, but there was much that Chase could accomplish. He proposed to build the temporary buildings, a house for the superintendent and quarters for the engineer in charge. He further proposed to build barracks to house 150 men and to collect 2,000,000 bricks on the site. He acknowledged receipt of the plans shortly thereafter.¹³

In September Chase predicted that Fort Pickens would be completed by 31 March 1834.¹⁴ Work being accomplished at that time was largely on the grounds. Gradual slopes were covered with nine inches of clay and one-half inch of shells upon which Bermuda grass was planted. The shells held the soil until the grass had become established. Chase found that this process worked very well in this sandy site almost void of topsoil. The steep slopes were covered with clay from one to two and one-half feet thick. The terrepleins were covered with one and one-half inches of shells and the parade with four inches. The fort was taking on its finished appearance, and Chase expressed hope that the Board of Engineers would visit and inspect his work. He found great satisfaction in the end product of his efforts.

The fort was not completed by the predicted date. Chase was able to report on June 1834 that he was ready to remove all

temporary buildings from the vicinity of the fort, both those constructed by the Corps of Engineers and those by the contractor. He recommended that no buildings be permitted within 800 yards of the fort in the future, as they would tend to interfere with the operation of the fort for defensive purposes. The casemates had been covered so as to render them perfectly dry. A garrison could be housed there, so there was no necessity for structures outside the fort. Fort Pickens was complete and would be ready for a garrison by 30 September, Chase reported to the Chief Engineer 20 August 1834.

The Corps of Engineers were destined to be vitally associated with the fort throughout its useful existence, however, because it had to be constantly modified to meet the changing requirements of the defense system and repaired as decay and other considerations caused damage. By the time the fort was completed, it was evident that proper consideration of the pressures of sand against the walls had not been given. The northeast bastion was already yielding to pressures due to a lengthy rainy season in the late winter of 1835. It became necessary to take down the masonry of most of two faces of that bastion and increase the dimensions of the foundations and scarps.¹⁵ It is not clear who was at fault though Chase recorded no dissatisfaction with Strong's work. Chase observed that that area had been constructed first and permitted to stand nearly three years before the ramparts and parapets were constructed. The severe weather had not impaired any other area of the fort. Estimated cost of repairs was \$12,000.

During March 1835 three magazines were completed with the largest having a capacity of 1000 kegs of powder. The other two held about 680 kegs. The fort was ready for occupancy and the work of the Corps tapered off. The next major responsibility would be the construction of mounts for larger guns as the original guns had already become obsolete.

As the work on Fort Pickens reached its final phase, work on the three other projected forts got underway in the Pensacola Bay area. Those were Fort McRee on Foster's

Island, Fort Barrancas on the mainland, and Fort Redoubt situated 1500 yards behind Fort Barrancas. By the time Fort Pickens had been completed, the area had lost much of the frontier complexion. No longer were there references to the Gulf Coast Frontier. Though vast areas of Florida still remained in a state of undeveloped wilderness and there was to be Indian trouble for another decade, West Florida was settling down to an agricultural economy and social and cultural institutions were emerging. The problems which troubled Chase in the construction of Fort Pickens had generally been resolved. The brick yards had become stabilized and sources of other supplies had become established. Chase had become comfortably established in his plantation home, Chasefield, near Warrington. Much of his work had become routine, and there were, therefore, fewer references to the details in existing records. Lieutenant Alexander H. Bowman, appointed a cadet from Pennsylvania in 1821 was assistant engineer at Pensacola. He was placed in charge of construction of Fort McRee on Foster's Island. Chase employed Bowman in collecting materials and construction of temporary buildings and wharves. The plans were finalized in 1834 and actual construction got underway.¹⁶

Chase employed Jasper Strong to accomplish the work at \$8.60 per cubic yard of masonry.¹⁷ The fort was small and Chase predicted rapid progress and an early completion date. Foster's Island was only a strip of white sand running parallel to the mainland. Target date for completion was set at 31 December 1835. Chase suffered a setback in his projected execution of the construction however. The appropriation bill for fortifications failed to pass Congress in 1835. Chase concluded that it would result in great loss to the public if operations on the Gulf of Mexico were suspended. In order to save as much as possible, he sought to keep the project going through his personal means and private credit. Strong expressed willingness to do the same. He reported to the Chief Engineer that he and Strong would carry on until the next fiscal year appropriation was made unless directed to do otherwise. He had intended to request a leave for a few

months to visit the Virginia Springs, but decided, under the circumstances, to remain at his post.¹⁸

Gratiot, Chief Engineer, was in agreement with Chase that the failure to make an appropriation in 1835 was expensive. He observed that work had to be restricted to that which could be accomplished with balance on hand. This necessitated reassigning officers and dismissing artisans, mechanics and laborers whose experience and skill would be difficult, and in some cases impossible, to replace. It was also necessary to store or sell materials and machinery.¹⁹

When Chase had exhausted his balance on hand, the construction of the platform foundations of Fort McRee were in progress. Great care had been taken at great effort in laying those platforms due to the exposed nature of the island. Chase saw the probability that all this effort would be lost if they were not secured by construction above high water mark. On his own credit, therefore, he continued the project in anticipation of the next annual appropriation. Work was continued thus for nearly four months, and the safety of the foundations was secured. The entire structure was accomplished about five feet above the high water level. There was also much material on hand which was subject to great damage if not worked up. Strong continued to employ his labor force at his own expense until such materials were used, also relying on the next appropriation to reimburse him for his services. Much expense had been saved, but large arrears had occurred. Chase requested an appropriation of \$160,000 for the next fiscal year to cover the arrears and to complete the fort.²⁰

There were alterations in the plans which necessitated increased height of the scarp wall and thickness of the bombproof casements. Chase noted that this involved additional cost, but did improve the facility. He was able to continue construction with the coming of the new fiscal year in 1836, and received sufficient funds to complete the project.²¹ Congress made no appropriations again in 1836 for the 1836-37 fiscal year for fortifications, but Fort McRee was completed

in October 1836. Twelve rooms in the casemates were furnished for officers quarters and six large rooms for soldiers. Chase had expended \$33,000 on his own credit for which he still had not been reimbursed. This amount was requested in the estimates for the 1838 appropriation.²² There remained only certain modifications and additional quarters, and Chase would be ready to turn the fort over to a garrison. In 1839, Fort McRee was still \$7,000 in arrears.²³

With Forts Pickens and McRee completed, Chase turned his attention to the mainland. He suggested occupying the old battery at Barrancas in case it became necessary to resist an attempted invasion. The battery could be put in order to receive twelve guns bearing on the harbor for about \$3,500. They could undoubtedly be retained as a part of the overall plan whatever it might be. In 1835, he began preparations for gun mounts. In the absence of permanent defensive works, Chase proposed to draft a plan for a line of field works from Barrancas to Grand Bayou. The adequate defense of the navy yard necessitated a redoubt for Barrancas, he observed.²⁴ A line of field works would serve until the redoubt could be constructed.

Old Fort Barrancas was in a fair state of repair. It had been a site of defensive works since the Spaniards constructed Fort San Carlos de Barrancas during the last decade of the Seventeenth Century. The position was taken by the French twice between 1718 and 1722, and the fort was practically destroyed. It was rebuilt by the Spaniards. In 1763 it passed to the British and was garrisoned by them until 1784, at which time Spanish control was restored.

During the War of 1812, Andrew Jackson demanded surrender of the fort and occupied it for a time. The Spaniards had violated their neutrality, having permitted the British to be outfitted in Pensacola harbor. Jackson occupied the fort again briefly in 1818 because of alleged encouragement by the Spaniards of predatory incursions of Florida Indians into Alabama. Florida was ceded to the United States in 1819 and Fort Barrancas was occupied by the American troops 20

October 1820.

Old Fort San Carlos de Barrancas was a small fort constructed in a semi-circle with a moat. The guns were all directed toward the ship channel. The Board of Engineers formulated plans for a much larger fort to be constructed in the hillside above and behind the original structure, while leaving the old fort intact. The two were connected by an underground tunnel.

Construction records have not been found, but the project did not get underway until 1840. Some of the delay was doubtless due to the severe economic depression which followed the panic of 1837. The price of cotton on the New Orleans market fell to almost one-half its former amount. Land and slaves saw a corresponding decline. The Federal Government, previously enjoying a surplus each year, had a deficit every year between 1837 and 1841 except in 1839. There were numerous bank failures. Congress was unable to fund programs adequately as it had previously done.

The Seminole War raged in central and south Florida from 1836 to 1842. This doubtless also slowed progress on the Gulf Coast defense system by diverting funds to finance the war. The war had so depleted the regular army that in July 1838 its authorized strength had to be increased from around 7,000 to about 12,000 men. By the time the war ended in 1842, some 10,000 regular soldiers and an estimated 30,000 short term volunteers had been engaged. Almost 1,500 men had lost their lives in battle or from disease and about \$30 million had been spent.²⁵ This occurred just at the time the Government was resorting to deficit spending. There would not be adequate money nor engineering personnel to carry on the many projects of the Corps of Engineers again before they were all disrupted or altered by the coming of the Civil War in 1861.

Construction of the new Fort Barrancas finally began in 1840. A companion fort, Fort Redoubt, was projected 1500 yards to the rear of Fort Barrancas to give that fort protection from a possible land invasion. Though

the fort was a redoubt, eventually the term began to appear as a proper name, and the facility has been known since as Fort Redoubt. It appears, however, that the engineers, both Chase on the local scene and those in the Chief Engineer's office, often looked upon Fort Barrancas and Fort Redoubt as one defense project. Records often fail to mention Fort Redoubt though some construction listed in reports under Fort Barrancas appear to have been actually accomplished on the redoubt.

The two forts were pentagonal in shape as were the other forts designed by Bernard along the Gulf Coast, and they also reflected the traditions of Marquis de Vauban, but the enceinte, the encircling fortification around the fort, was formed of five straight walls. There were no bastions at the corners. Each had moats on four sides with heavy masonry and earth works built into the hillsides into which the forts were constructed. The final shape of each, therefore, emerged as a "U" with a pentagonal fort inside.

Joseph G. Totten, then Chief Engineer, observed in 1842 that the Pensacola fortifications presented a formidable and efficient array of strength. He predicted that the entire system would be completed within two or three years. There was one problem, however, the isolated position of Pensacola. There was no easy and safe communication with sources of supply and relief. No significant population had developed in the area, and due to the infertile nature of the soil, would not do so in the future.

Totten stated that there was a time when private enterprise seemed about to convert that mere harbor of refuge into one of the great ports of western commerce by opening a speedy and direct communication with the interior. He did not state the nature of the proposed project, but observed that it had failed or had been delayed. It appeared that the government might have to assume responsibility for opening such a line of communication in the interest of national defense. Though there was emerging a genuine national army by this time, sudden emergencies would have to be met by local militia and temporary

volunteers for some time to come.

Fort Pickens was considered complete in 1843, but slight modifications were already needed. No work was being accomplished at Fort McRee except for the construction of two hot-shot furnaces, both of which were almost completed. The next year, 1844, Totten was able to report that Fort Barrancas was complete and was considered adequate both in defense capability and in execution of construction.²⁶ Future reports refer to construction of barracks, however.

The defenses of Pensacola were now complete except for Fort Redoubt. Totten was well pleased with the final results. He observed in his 1845 report that the navy yard could receive any vessel which might take refuge there, and that the safety of the harbor now warranted any extension of facilities desired to repair and equip vessels. Pensacola still remained remote and isolated from sources of supply. He considered this serious enough to justify the particular attention of the Government. The Chief Engineer lamented that Congress had not been able to appropriate adequate funds for the past seven years. Construction of defensive works had progressed very slowly since the depression of 1837. The Corps had become conditioned to expect little money. Appropriations were made, not on the basis of needs as they were presented, but on the basis of past appropriations which were now far too small.

The Mexican War broke out in 1846. One company, the First Artillery, was stationed at Fort Pickens. The entire Corps of Engineers had only 128 officers and there were forty-three in the Topographical Engineers. Many of those were assigned to the generals on the fields. The work at Pensacola did not require all of the attention of Chase now and he was assigned to a special board of engineers in 1844. While serving on that board he conducted examinations of the Florida Reef, 1844-45; the Gulf Frontier of Mississippi and Texas, 1845; the Memphis and Pensacola navy yards, 1851; and the New Orleans Customs House, 1851. He served on the Board of Engineers for Atlantic Coast Defense from 13 March to 13 September 1848.²⁷ During

that time he continued his assignment at Pensacola, which included acting as superintending engineer for the Mobile area. The 1840's represented a trying period for the Corps of Engineers and Chase experienced disappointing results for the next decade or so.

Effort was made during the decade, 1850-1860, to complete the Gulf Coast defense system. Projects which were advanced in-

cluded the completion of Fort Redoubt at Pensacola, Fort Gaines and Powell on Mobile Bay, and Fort Massachusetts on Ship Island. By the time they were completed, however, they were already out of date and all those previously built were having to be updated. The two decades 1840-1860 were crucial times for the Corps of Engineers, presenting many problems concerning the defense system.

CHAPTER IV:

YEARS OF ADJUSTMENT: 1840-1861

The decade of the 1840's saw two unrelated factors greatly influencing the operation of the Corps of Engineers in its Gulf Coast defense projects. One was the consistent failure of Congress to make reasonably adequate appropriations during the early years of the decade. The other was a change in military tactics which was rapidly outdating the Old Vauban system of defense based on the walled forts.

Chief Engineer Joseph G. Totten, made a strong appeal for support in his report to Joel R. Poinsett, Secretary of War, in 1839. He observed that some of the largest cities and towns in America were insecure. The frontier especially needed attention. Totten had the forts on the Gulf of Mexico inspected in 1838. He requested a report of their condition forwarded to him without delay. The report should state their present condition, necessary repairs to place them in a condition of complete efficiency, and an estimate of such repairs.

The report was a discouraging one. The forts had never been garrisoned, and upkeep had not been continuous. As was to have been expected, each fort was found to be decayed and dilapidated due to the humid climate of the area. In addition, the permanent traverses and pintle centres adapted to new seacoast carriages were not yet laid in any of the Gulf Coast forts. It was deemed highly desirable that all be placed in a complete state of efficiency without delay. Totten ordered that a less hurried, more minute, inspection be made during the winter of 1839-1840, and estimates of cost of updating the forts be given.¹

Due to the prevailing economic depression, the 1840 appropriation included almost nothing for internal improvements, and only \$1,042,803.59 for fortifications to be expended throughout the United States. The total budget for the Corps for that fiscal year was \$1,138,969.22 to be divided among fortifications, harbors and rivers, roads, lighthouses, and the military academy. The appropriation for fortifications was not made until July

and restriction of the Treasury made the funds unavailable for the remainder of that fiscal year.²

Despite the prevailing impositions, Chase had been able to start construction of Fort Barrancas in April 1840, and had initiated plans for updating Forts McRee and Pickens. He purchased 40 sets of pintle blocks for Fort McRee and accomplished minor repairs. Inspection of Fort Pickens revealed that the weight of newly installed stone blocks and traverses for Barlette guns threatened to cause the counter scarp walls to collapse. He proposed to strengthen the walls.³

During the course of the next two years, foundations for mounting 2,085 new guns had been completed throughout the coastal defense system. The Chief Engineer reported that two years before, 1840, except for certain unfinished projects, the greater part of the coastal defenses were either in a state of deterioration from injury or abandonment, or were entirely dilapidated from long neglect and that there were large areas of coast, including some populous cities, and the most valuable government facilities where hardly a gun could have been mounted.⁴ While things had improved some since 1840, the Corps of Engineers still labored under handicaps as reflected in Totten's 1845 report.

He lamented that Congress had not been able to appropriate adequate funds during the past seven years to advance the construction of defense works as rapidly as could have been realized otherwise. He observed that appropriations were continuously made based on past appropriations which were now far too small. He did speak of the Pensacola harbor defense facilities with pride, however, and observed that the defenses of that harbor were in a condition of efficiency, affording shelter for vessels of all descriptions. The facilities warranted any expense which might seem desirable for repairs and upkeep. Pensacola, with Fort Barrancas having been completed in 1844 and despite the fact that the projected redoubt had not been constructed, was doubtless one of the best protected harbors in America.

The invention of explosive shells and the greater use made of curved fire also necessitated a radical alteration of fortifications. While this was not implemented until the late 19th century, the problem was evident by the 1840's, and had caused the Vauban type defenses to have been completely outdated by the Civil War as evidenced by the failure of those forts to withstand attacks. The future system, evident as early as 1845, was decentralized fortifications. Instead of concentrating artillery within forts, European engineers were constructing concealed batteries outside the walled forts. Direct fire guns were placed in revolving or disappearing cupolas of subterranean bases. A sub-surface type of fort encased in thick concrete was also adopted. There was elaborate use of trenches, often connected with a belt-line railroad.

While this revolution in defense tactics had not arrived in America by 1840, Totten could foresee it and sought to be prepared. He made an appeal for a body of engineer soldiers, composed of sappers, miners, and pontoniers.⁵ The aid of troops trained in those areas would be invaluable in time of war. Such were generally maintained by all the great armies of Europe, both in time of peace and war, and had been used during the American Revolution. They were instructed, drilled and disciplined in time of peace so as to qualify them for skillful execution of the various labors of sapping, mining and bridge building, and many other "half-mechanical" operations.

Such had been employed by Vauban as early as 1679. The Duke of Wellington requested in 1812 that England establish a corps of sappers and miners. It was inconceivable, he said, with what disadvantages the English Army undertook anything like siege because of the lack of assistance in that area. He observed that there was not a corps of the French Army which did not have a battalion of sappers and a company of miners. Totten outlined the nature of the proposed corps of engineer soldiers, and backed his argument with an array of victories in European wars because of the support of such and losses because of the lack of this type

of support. The American engineers were keeping close watch on European progress, but were unable to secure adequate appropriations from Congress to keep up in some areas, though coastal defenses continued to receive attention.

Totten styled the defense system planned by the Board of Engineers for coastal defenses under Bernard's direction the third defense system of the United States.⁶ He observed in 1850 that it had been under construction for thirty years, and had met the support of each succeeding administration. Congress sometimes delayed appropriations, but after careful examination by the congressional military committee, had always acceded to the requested support. There were in 1850 permanent forts and batteries protecting most of the important points of the coast and mounts were ready for installation of over 4,000 cannons. The coast of the United States was in a state of comparative security. He conceded that some ports of lesser note had become objects of importance because of their connection with commerce, or with government facilities.

Mobile, he noted, was not a large city, and it was almost out of the enemies' reach because of the shallowness of its bay. There were, however, hundreds of ships lying every winter close to the ocean awaiting their cargoes of cotton. They had no protection except that afforded by forts at the mouth of Mobile Bay. Fort Morgan, already completed, and Forts Gaines and Powell projected for construction also afforded protection for the commerce and communication between Mobile and New Orleans.

Totten observed further that Pensacola had little of its own to excite the cupidity of an enemy, but its bays were the best harbor, and that was the site of the only navy yard in the Gulf of Mexico. That year, 1850, the first exterior battery was started at Fort McRee. Foundations had been excavated and part of the concrete poured. Materials for construction were on hand. This was evidence that the Corps of Engineers had realized the inadequacy of just the forts themselves.

In this climate of change, the construction

of the last four forts projected for the Mobile District was initiated. Chase was able to report in 1846 that Fort Redoubt was under construction. Heavy excavations had been made for the foundations. The excavations were followed closely with masonry to prevent cave-ins of the soft, shifting sand.⁷ The next year progress continued. An appropriation had been made for permanent quarters to be constructed outside the fort, but a land settlement had to be negotiated with the Navy Department before construction could begin.⁸ During the next year, 1848, negotiations were completed and construction was begun, but lack of funds slowed progress. Failure of Congress to appropriate funds resulted in the elaborate report from the Chief Engineer in 1850.⁹ The report did not impress Congress sufficiently to get action. Little money was made available for the next several years. Not only was progress slow on those projects under construction, but it had become clearly evident that the increased size of the guns on battleships necessitated updating the guns in the entire coastal defense system.¹⁰ Despite the critical problems, there was a drastic cut in personnel. Chase was assisted in Mobile by George Welcher at Mobile Point from 1844-1852, and Jeremiah Scarritt from 1847-1853. Lieutenant P. T. G. Beauregard was assigned to work toward construction of Fort Gaines on Dauphin Island, 1848-1849, but by 1855 there was only one officer in the Mobile area, Captain Danville Leadbetter. He was responsible for Fort Morgan, Fort Gaines, and other projects in the Mobile area.

The annual reports did not note the completion of Fort Redoubt. The 1857 report noted that Captain John Newton was in charge of the Pensacola Bay fortifications, and that Fort Redoubt was almost complete. Work remaining included completion of the parapets, the terreplein, and gun platforms. Interior wood work of the magazines and the gateway were still incomplete and there remained a great deal of grading and sodding, and the bridges still had to be constructed. The 1858 report did not mention Fort Redoubt, but a new superintending engineer had been assigned to the area. It is assumed that the fort was now complete. John Newton had been

transferred to Utah and Lieutenant F. E. Prime arrived 4 March 1858 to take his place. His responsibilities were extended to include Fort Morgan and Fort Gaines the same year. By this time work was progressing at a rapid pace toward rebuilding the gun mounts and mounting larger guns.

Three forts remained to be constructed in the Mobile District in the pre-Civil War era. They were Fort Gaines, Fort Powell, and Fort Massachusetts on Ship Island.

The Corps had spent nearly a half-million dollars on the fort on Dauphin Island before construction was suspended in 1821. It was over twenty years before serious attention was given to the project again. During fiscal year 1843-1844 the Corps made extensive surveys of Mobile Bay. A study of the charts and maps of this survey reaffirmed the report of Bernard which was first made in 1817 and stated that a fort was needed on the eastern end of Dauphin Island.¹¹ Fort Morgan was considered adequate to defend the main ship channel, but Mobile Bay was too wide for its guns to protect a lesser channel near Dauphin Island and left Mississippi Sound completely unprotected. The Board of Engineers for Fortifications renewed its request for a fort on Dauphin Island, and soon after it revived a request for a tower for Pass au Heron. Those two additional forts would round out the Mobile Bay defense system, and give protection against smaller vessels which might otherwise invade the bay and wreck the harbor. The Chief Engineer requested \$20,000 for the 1845-1846 fiscal year to initiate the project. The next annual report stated that the requested sum was not appropriated by Congress, but the Chief Engineer reaffirmed the need for the projects. The funds were made available in 1846, but construction was delayed pending acquisition of title to the land.

Securing a clear title to the eastern end of Dauphin Island proved a much more tedious task than anticipated. The entire island had been acquired by Augustin Lacosta by an old Spanish land grant. Lacosta gave one half of the grant to Joshua Kennedy and paid the necessary fees in securing a con-

formation of the title to the grant from Congress. The other passed to Samuel H. Garrow who, in turn, subdivided it and sold, transferred, mortgaged, or otherwise disposed of the various portions. Some portions had more recently been sold by the Sheriff. Titles to only two portions of one-thirty-seconds each could be cleared. Ogden had properly registered those titles, but by the time the government set about to secure the land Kennedy had died and his holdings had become estate property. Other portions were held by heirs of the estates of George and C. W. Sanford, which were in trusteeship. The F. C. Heard estate held claims as well as Blyden van Buren, Joseph Climents and F. S. Blunt.¹²

Jeremiah M. Scarritt was assigned to Fort Morgan and Dauphin Island in 1847. He remained until 1853, so it was his burden to secure the title and to initiate construction of Fort Gaines. He expressed his belief that he would have to go to the Alabama legislature to secure a clear title to the property.¹³ The process was initiated and on 25 May 1848 Scarritt was informed by A. B. Week, District Attorney of the Southern District of Alabama, that proceedings had been completed, and that all that remained to secure title was for the United States to pay the assessed value of the claims to the Chancery Court.¹⁴

It was not until 3 December 1853, however, that the deed was finally delivered to the Corps of Engineers.¹⁵ After six years of litigation, the way was now clear to begin construction of the fort. By this time Scarritt had been transferred; Captain Danville Leadbetter had been assigned to Fort Morgan and Fort Gaines. He remained at that post from 1853 through 1857. No report of work accomplished appeared until the 1857 annual report, and then only slight progress had been made. The wharf had been extended 100 feet, and certain permanent buildings had been constructed, but no work on the actual fort was reported. The journal of the day to day activities, however, reported that work clearing and preparing the grounds began in February 1857. Trees had overgrown the site of the original fort construction, and they had to be cleared away. On Friday, 27 February, Captain Leadbetter arrived from Fort

Morgan and gave instructions. Seven slaves had left Mobile on Wednesday, had gotten lost, and did not arrive until Friday. On Saturday 28 February nine hands were employed repairing the wharf, ten excavating for foundations, and two were clearing the grounds. There were a total of twenty-one persons employed.¹⁶ On 19 March 1857, Captain Leadbetter visited again bringing Lieutenant Snyder. Snyder remained as resident engineer, but for how long is not known. His name did not appear in the journal again.

Gradually the labor force increased. The sloop *Mischief* was arriving almost daily with supplies and slaves. In June the laborers exceeded 100. Among them were three slave women. One was employed washing clothes for the men, one was carrying water, and the other was pounding brickbats. The old bricks used in the original fort were broken to gravel size and used in making concrete. On 27 June, there were five white men and 102 slaves working on the project.

By August the ground work had been pretty well accomplished and work on actual construction could get underway. The labor force now included masons, carpenters, a blacksmith, and the various other artisans required for the project. The labor force became somewhat stabilized at around 100. They were shifted to tasks as changing construction required. About ten slaves were kept busy continuously pounding the bricks of the old construction project for some time. The construction settled down to pretty much of a routine. Dr. S. R. Sullivan was the surgeon for the project. He also served Fort Morgan.

Lieutenant Frederick E. Prime was assigned to Dauphin Island with responsibility for superintending the construction of a projected fort on Ship Island off the Mississippi coast and the projected tower at Pass au Heron along with his duties at Fort Gaines. In his 1858 annual report, he was able to note that the glacis were wholly embanked on three of the fronts and partially on the other two. Two bastions had been raised to twelve feet, and the other three to fourteen, eight, and six feet. An estimated \$100,000 would complete the project. Work ceased in September 1858 for lack of funds.

Just how much was accomplished before the state of Alabama took over the project in 1861 is not known. Lieutenant Prime left Dauphin Island 18 January 1861 when Alabama took possession of the fort. When the fort was retaken in 1864, the Corps reported that construction had been carried on by the Confederacy and the project had been completed according to the original plan with almost no modification.

The final structure of the Mobile Bay system of fortifications was the tower at Pass au Heron, Fort Powell. In Bernard's report of 1817 he projected a structure on a small shell or sand bank at Pass au Heron. He concluded that all that was needed was a Martello Tower. The channel was narrow and practicable only for boats or such small craft as navigated the inland pass to New Orleans. Only a few pieces of ordnance were necessary. The projected tower was thirty-six yards in diameter with six guns on the channel side of the island and six facing the land. Thirty-six men would be sufficient to man the fort in time of siege and only ten in time of peace. Estimated cost in 1817 was \$16,677.41.

When Congress decided to suspend work on the fort on Dauphin Island in 1821, nothing further was said about the projected tower to protect Pass au Heron for many years. In the meantime, the Alabama Legislature gave a monopoly on the pass to Captain John Grant, who constructed a toll gate and charged for the passage of boats. The act became law 2 February 1839. The monopoly was granted on the condition that Grant excavate a channel of sufficient depth for the passage of steam ships or other vessels drawing five feet of water. The channel must be of sufficient width for safe passage. It must be completed within twelve months of the date of the signing of the bill. The monopoly was granted for seventy-five years, and would be revoked if at any time the channel did not have the required five foot depth for a six month period of time.

Grant was authorized to charge fifteen cents per ton of cargo and could sue and seize property for non payment of tolls. He

was further authorized to sell or convey any portions or all of the rights and privileges conferred upon him by the act. In no way did the act convey fee simple title to any land. It was only a seventy-five year monopoly to excavate, maintain, and charge toll on the water channel.

Totten, Chief Engineer, instructed Ogden to reserve all lands between Dauphin Island and Cedar Point for military purposes in 1842.¹⁷ In acknowledging his instructions, Ogden noted that no claims to the islands had been registered with the land office in St. Stephens, Alabama.

An act of Congress 3 March 1857 appropriated \$100,000 for the construction of the long delayed projected tower to protect the pass which henceforth was known as Grant's Pass. Grant appears to have tried to establish ownership of the island. He had occupied an island by the channel since 1839. "Harper's Weekly" 26 March 1864 included Grant's Pass in one of its illustrations. There were on the island what appears to have been a rather substantial dwelling, probably a keepers house, and a number of lesser structures including a lighthouse. The channel itself was lined with piles and had a toll house. There were also a number of tents for military personnel, this being during the Civil War, just before the Battle of Mobile Bay. There was some question regarding Grant's claims. The Corps of Engineers requested that the Alabama Legislature cede jurisdiction of the island to the United States. Percy Walker, a member of the legislature was given the necessary information and was engaged to introduce and sponsor the bill. He agreed to do so.¹⁸ Walker expressed concern that the tower be built and promised diligent efforts in securing passage of the bill. He expressed the conviction that the 1839 act conveyed no land to Grant, but rather the right to take possession of so much shoal or shell reef as was necessary to excavate a channel. There was no known record that Grant or anyone else had secured title to any of the islands between Cedar Point and Dauphin Island. All the title needed was that conveyed by the State of Alabama. Another local resident, Jacob Baptiste, re-



FORT MASSACHUSETTS, OCTOBER 1974

ported having known Tower Island since 1815 when he became master of several packets plying between New Orleans and Mobile. He was constantly using the channel until 1829 but had never known of any claim to the island. Jurisdiction was acquired from the state of Alabama in 1859.¹⁹ Disputes were destined to arise in the future, however, over Grant's Pass.

While jurisdiction was being secured, a special board for fortifications was finalizing plans for the defense of the pass.²⁰ Lieutenant Frederick E. Prime succeeding Captain Danville Leadbetter as superintending engineer arrived in 1858 and was present when Alabama took charge of the fort in 1861. Compared to Forts Pickens and Morgan, the tower was a minor structure. It was constructed so that it could be easily demolished by explosives if there was danger that it might fall to an enemy. This was the fate of Fort Powell. Colonel J. M. Williams planted explosives and set the fuse. On the night before the surrender of Fort Gaines, he got all his own men through the deep water to Cedar Point and then blew the fort to pieces. At the time of writing, that portion of the island upon which the fort was situated was submerged. The remnants of the foundations are under water. A little debris found on the tiny island that remains is the only reminder that such a fort ever existed.

The last of the coastal forts in the pre-Civil War defense was that on Ship Island off the coast of Mississippi. This fort was not among those projected by Bernard. It was the only defense structure in the Mobile District which Bernard did not help locate and plan. Just when the structure was projected has not been determined since no reports have been found within the scope of this research which treats the planning stage. As it was finally projected, it was a modified Martello Tower type structure. It is a circular fort with the exception of the eastern front which is straight with the wall recessed slightly from the otherwise circular form. The fort was built on the extreme western end of Ship Island and was designed to protect the ship channel into Mississippi Sound. The current Gulfport ship channel cuts directly across the western tip of the island, and after the

1969 hurricane, Camille, the entire fort was sitting in water with the exception of a small strip of sand which extended to the southeastern wall. Unless the land reforms through natural accretion as often happens after such a storm, the historic landmark appears doomed.

An appropriation of \$100,000 was made to initiate construction of the fort in 1857.²¹ It was noted that the plans had not been completed at that time, but it was anticipated that \$50,000 could be expended during the 1857-1858 fiscal year. The construction was directed from the Mobile office with Lieutenant N. F. Alexander resident engineer in charge of actual construction.

Construction began about July 1859, jurisdiction over Ship Island having been obtained from Mississippi. Experience in construction in sand at Fort Morgan, Fort Pickens, Fort McRae, and Fort Gaines had eliminated most of the technological problems by now and the Gulf Coast was no longer a frontier. Supplies and facilities were more readily available. The construction appears to have gone on according to schedule, but the fort was incomplete in 1861 when Mississippi seceded from the Union. On 13 January 1861, the fort was visited by a body of armed Mississippi militia. A second group arrived the same afternoon and some remained on the island. A third body took possession by force on 20 January. Prime had gone to the island and for some unexplained reason remained until 30 January. The fort remained in Confederate hands until 30 November 1861 when it was reoccupied by the Union soldiers. It was noted that no material damage had been done during Confederate occupation. Ship Island became a prison camp for both war prisoners and civilian political prisoners during the war.

The two decades preceding the Civil War saw the completion of construction for the eight forts which rounded out that portion of the national coastal defense system which fell within the Mobile District. Already they were having to be modified to accommodate larger guns. This occupied a great deal of the time of the officers in charge and the available funds. There were seldom sufficient

funds to accommodate all the projects. In 1848 the officers of the Corps requested \$850,000 for the next fiscal year. The Chief Engineer requested \$665,000 and Congress appropriated \$515,000 and this despite the fact that the recently acquired West Coast required protection.²²

Work was also required to repair and often to rebuild the wharves, especially after the storms to which the Gulf of Mexico is subjected. Barracks also required funds and attention. They were under construction at Forts Redoubt, Pickens, and Morgan during that period. An example of the activities is contained in the annual report of 1851. The citadel devoted to officers quarters at Fort Morgan was under construction. Three fronts had been carried as high as the sills of the second story and all the floor arches of rooms and galleries had been turned. A gale in August had damaged the wharf. This had been repaired and the foundations of the wharf secured by laying an extensive apron of broken bricks around the piers. One of two projected exterior batteries had been completed at Fort McRee. Four divisions of the barracks at Fort Barrancas had been completed; another nearly completed and two more were under construction. Fort Pickens was in a state of good repair and had required no attention.²³

Almost no activity was possible for the next several years because of the lack of appropriations. The situation became so critical that Totten made a strong charge in 1855. He observed that he had pressed strenuously for the means to complete the defense system during the entire seventeen years that he had been Chief Engineer. If Congress had voted him the means, he declared, the important points of the Atlantic Coast would be secured. "If, therefore," he said, "circumstances of peril should awaken the nation to a sense of the backwardness of defensive preparations at any important places, it must be understood that the engineering department is in no sense responsible for the delay." He expressed hope that there was still time.

Totten noted that the introduction into maritime war of guns of greatly enlarged cali-

ber would make it necessary to reform to a considerable extent the armament of all sea-coast defenses. The War Department established a special board to determine the caliber guns required for each defense facility. To install the larger guns would require considerable modifications in the existing facilities. Totten urged that Congress take this into account and augment the appropriations accordingly. He considered the situation critical and urged immediate action.²⁴

Congress began to respond as reflected in the progress being made in accomplishing the necessary modifications to accommodate the larger guns. Work was begun in 1857 in the Mobile District. The Pensacola defense modifications were under the direction of Captain John Newton, who replaced Chase upon his retirement. Captain Danville Leadbetter directed the modifications at Fort Morgan.²⁵

As the decade came to a close, work to update the forts increased. By 1860 all platforms had been completed for mounting the larger guns at Fort Pickens. The work was ready to receive entire casemate armament. Preparations had been made for mounting new barbette armament of heavy caliber on one curtain and two bastions, and for lighter armament on the remaining fronts. Prime recommended that the latter be replaced with heavy cannon and urged that no time be lost in accomplishing it.²⁶

Fort McRee was ready to receive new armament on the casemate tiers, but old guns were retained on the barbette tier. Prime requested \$50,000 for the next fiscal year to replace the old guns and to accomplish general repairs.²⁷

By the date of the next fiscal year's report, 1861, all the Gulf Coast defenses were in the hands of the Confederates except Fort Pickens. Major Z. B. Tower had replaced Prime as officer in charge. He was busy making preparations to meet an attack. Heavy guns were provided with traverses; guns and mortars mounted; and exterior batteries constructed and armed.²⁸

Fort McRee and Fort Barrancas had been occupied by the "insurrectionists" in late

January 1861.²⁹ An attempt to take Fort Pickens was led by Captain Chase, retired, but was unsuccessful. Fort Pickens was the only fort within the Confederacy which remained in the possession of the Union throughout the War.

There was no further activity of the Corps of Engineers in the Mobile District until the Battle of Mobile Bay in 1864. Totten reported in November 1861 that it had been necessary to pull most of the Corps engineers from construction projects and attached them to the large armies in the field. He sought to replace them with men in civil life, securing the services of ex-officers of the Corps when

possible.³⁰ John Newton, now Major, was attached to the army of the Potomac. Prime was made Chief Engineer of the Department of Ohio. Leadbetter had joined the Confederacy along with a number of other officers who had served in the Mobile District, including P. T. G. Beauregard who had been officer in charge of construction of Fort Gaines 1848-1849. Corps officers directed the placement of guns in the land attacks against both Fort Gaines and Fort Morgan in 1864. Immediately after the Battle of Mobile Bay in 1864 the Corps began repairs on Fort Morgan, directing the project from New Orleans.

CHAPTER V:

THE MOBILE DISTRICT AND INTERNAL IMPROVEMENT PROJECTS

The early surveys and improvements of harbors, rivers, and canals accomplished by Engineers were militarily related. They were considered necessary for the national defense. An act of Congress 30 April 1824 authorized the use of Corps of Engineers for internal improvements. That year a Board of Engineers for Internal Improvements was appointed. Serving on this board were General Simon Bernard, Colonel Joseph G. Totten, and John L. Sullivan, an experienced civil engineer. They were to accomplish surveys, plans, and estimates for roads and canals.¹

Bernard would bring rich experience to America in this area as he had in the area of a national defense system. A review of the map of France will reveal that the headwaters of a system of rivers radiate from southeastern France in a northerly, westerly and southerly direction. The old regime government of France had systematically connected those rivers with canals. The process was continued under Napoleon when Bernard was one of his most outstanding engineers. France emerged as one of the first nations of the world with an adequate transportation system. This system was to remain basic until the modern rail system was developed with Paris as the transportation hub of France. Not only had Bernard had experience in canal construction, but also in containing flood waters by means of earthen dikes or levees. He is accredited with having initiated the Mississippi River levees.

The Board was authorized to employ two or more officers of the Corps of Engineers. Officers so assigned in 1824 were Major James Kearney, Major John J. Albert, and Captain William G. McNeill. Both Kearney and McNeill were assigned to tasks in the Mobile District. They were subject to the authority of the Board of Engineers for Internal Improvements.

Internal improvements were destined to progress slowly in the South. By 1824, it was evident that the South would be agrarian. The long growing season, the availability of

large tracts of fertile soil, and staple crops which could be sold for cash and which required a lot of work to grow and harvest made the South ideally suited to a plantation slavery economy. In the Mobile District, it was largely a cotton plantation economy with river transportation the primary means of getting the cotton to market. Georgia, north-west Florida, Alabama and Mississippi were richly endowed with rivers suitable for the lightdraft boats used in transporting cotton.

With the passage of the first protective tariff act in 1816, internal improvements became identified with the tariff since tariff revenue was primarily used for such improvements. Southern planters were selling cotton in Europe and were importing many of the plantation necessities from Europe. They were paying the bulk of the tariff duties, therefore, but the revenue so derived was being spent largely in the industrial North. That, added to the fact that northern shipping companies were transporting the cotton to Europe and northern insurance companies were insuring the cotton cargoes to Europe and the merchandise purchased by the planters from Europe, the South saw a great drainage of its capital to the North. The southern statesmen came out strongly against the tariff and internal improvements. It is not surprising, therefore, that the major civil projects and larger expenditures were not in the South in the early history of the Corps.

The South was not totally neglected, however, and some internal improvements at Federal expense were initiated among the earliest projects. The more significant ones in the Mobile District were Mobile harbor, Pascagoula River and harbor and the Apalachicola River and harbor. Projects of lesser importance were added from time to time. Pensacola harbor received considerable attention as need for a deeper channel arose.

The act of 1824 which authorized the President to use the Corps of Engineers to initiate and accomplish internal improvement projects was the beginning of a new phase

of Corps work. Those projects have come to be designated civil as contrasted with military works. Under authority of this act, the Federal Government assumed broad powers to function within the various states. There immediately arose the question as to the limits of those powers. Just where did the federal powers end and state power begin. A statement of the subject of both the Chief Engineer and the Secretary of War was contained in the 1824 annual report. Major General Alexander Macomb, Chief Engineer, stated that it was the responsibility of the recently created Board of Engineers for Internal Improvements to determine which roads and canals were of "national importance" and to select the best routes for those. The distinction between those which were to be accomplished by the Federal Government rather than by states was the matter of national importance. As the issue was debated, the usual interpretation was that all intrastate facilities were state responsibilities. Macomb observed that those which fell completely within the boundaries of a state were that states' responsibility regardless of usefulness for commercial purposes or however vital to the transportation of the mail. He stated further that "the states have important duties to perform in facilitating, by means of roads and canals, commercial and political intercourse AMONG their citizens." He felt that the states were more competent to act within this sphere than the central government, being closer to the problems.²

John C. Calhoun, Secretary of War, 1817-1825, was basically in agreement with Macomb. He expressed faith that the states would assume their responsibilities in the area of internal improvements as their populations grew and capital became more plentiful. He acknowledged, however, that there was need for internal improvements which because of their general nature or magnitude should be accomplished by the Federal Government. It was his opinion that not only was it not the Federal Government's responsibility to accomplish projects which benefited only a state, but that it was unconstitutional. Any facility which promoted intercourse between parts of the same state

was not to be assumed as a national responsibility. Those roads and canals, however, which facilitated commerce and intercourse among the states and which enabled the Government to disseminate promptly, through the mail, information to every part of the nation were considered a national responsibility. Calhoun was a strong nationalist, but he saw a strong nation only if the authority due the states was reserved to the states. He was an outspoken advocate, therefore, for states' rights.³

The same position was held by President Andrew Jackson. Jackson was such a strong nationalist that he was called "King Andrew" by his opponents. Despite this strong national sentiment, and general opposition to the states' rights faction, he vetoed the Maysville Road bill during his second year in office, 1830. It was a time when the tariff was bringing in so much revenue that the treasury was developing a surplus. The nationalists would have used the revenue to finance an elaborate internal improvement program. Jackson had expressed his opposition to the program in his first annual message to Congress in 1829. He recommended that the surplus revenue be distributed among the states according to their Congressional apportionment. Martin Van Buren, then Secretary of State, advised him to put an end to the Congressional logrolling that resulted in construction of internal improvements at Federal expense. He did approve the Cumberland Road Bill 31 May 1830, three days after he had vetoed the Maysville Road Bill.

He gave as his reason for the veto the fact that the Maysville Road lay within the limits of a single state and had no connection with an established system of improvements. It was, therefore, not under Federal jurisdiction. Though he and Calhoun were political enemies, they were in agreement on internal improvements. Jackson's subsequent policy on internal improvements resulted in his curbing Federal expenditures on roads and canals, though it did not materially affect the appropriations for improvements of harbors and rivers. The question of Federal vs. State authority would persist until the Civil War, which saw the triumph of central

authority. Thereafter, the Federal Government would exercise supreme authority in matters of civil improvements.

While the question of authority was being resolved, a problem even more serious as far as Corps operations were concerned developed. Calhoun observed in 1824 that the Corps had been deficient personnelwise even before the civil responsibilities were given to it. He saw no way for the Corps to meet the demands being made upon it, or to effectively direct the expenditures of sums being appropriated by Congress.

The new Secretary of War, James Barbour, noted in 1825, that progress in construction projects was delayed due to the lack of officers. He insisted that their numbers must be increased; a condition which would not be difficult to remedy if the military academy were given the authority to train more men. The academy had just reported that it was forced to turn down twenty-nine of every thirty young men making application. Many of those applicants were capable men of great potential. The academy must be permitted, he insisted, to enlarge its operations and more graduates must be assigned to the Corps of Engineers.⁴

Congress relented and authorized an increase for both the Corps of Engineers and the Topographical Engineers by two second lieutenants each over and above the current authorized strength. This was to continue until the overall gain by each had reached four additional second lieutenants. Those were to be appointed from the most outstanding graduates of the military academy.⁵

This personnel shortage probably accounts for the failure of Congress to include Mobile in the civil projects at first. The only civil project which touched the deep South was the Washington to New Orleans national road. Subsequent records revealed that extensive surveys were made, but the road was not constructed.⁶ Projects were funded for which there was not adequate personnel to direct. For that reason, one of the officers on duty on the Gulf Coast Frontier in 1824 was transferred to North Carolina where ex-

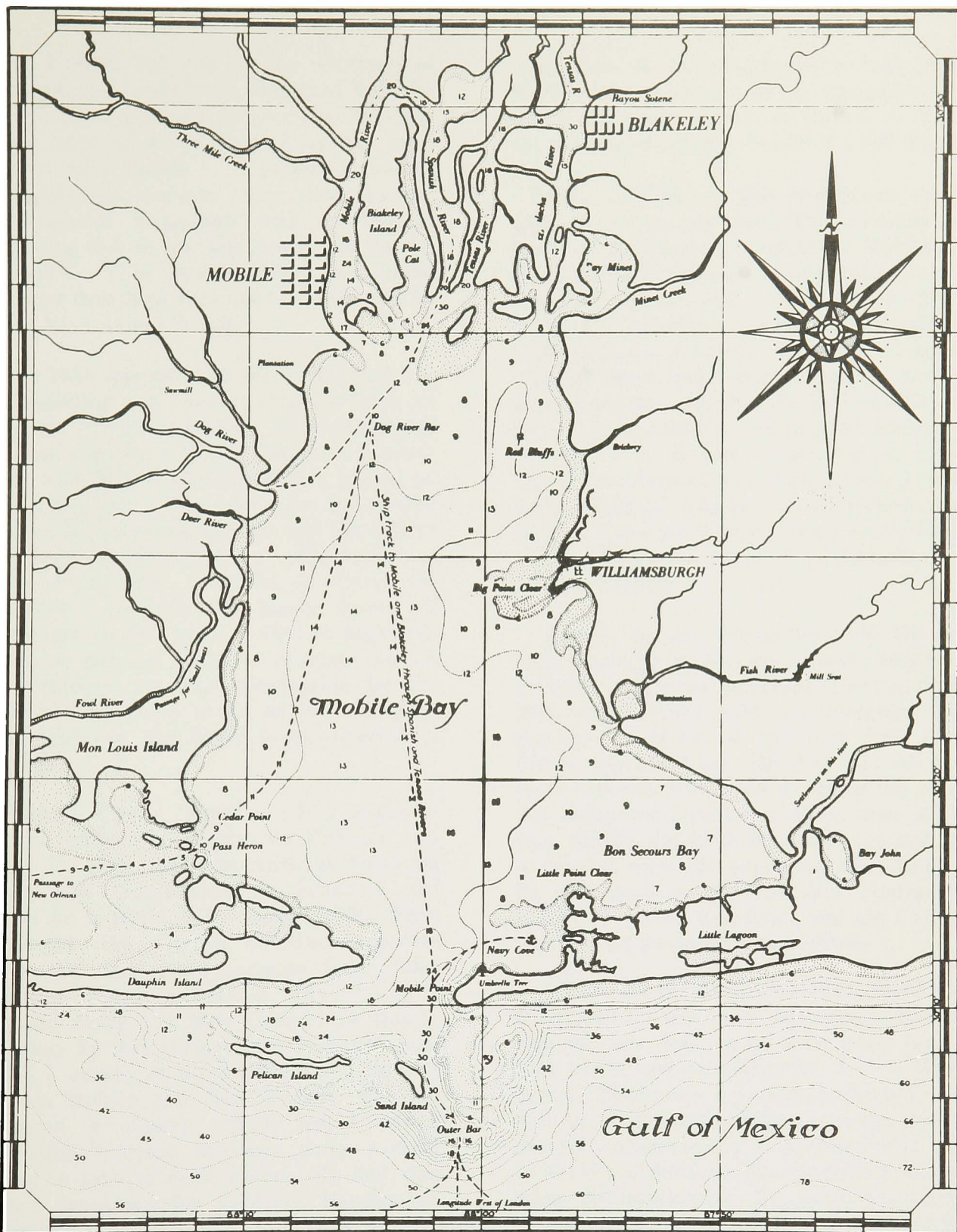
tensive work had been projected at Bogue Point at Beaufort, but for which there was no officer. As the Corps began assuming responsibility for civil projects, it was hampered by the political climate resulting from the issue of central vs. state authority, and, even more seriously, by the lack of adequate personnel.

Work in Mobile Bay was initiated in 1826, but a channel for ocean-going vessels would not be accomplished until after the Civil War. The very life of Mobile as a port city was dependent upon harbor improvements. Because of this, the work of the Corps was of tremendous importance to the future development of the city.

Mobile was selected as a site for the first capital of French Louisiana in 1702. The port for the city was on the south side of Dauphin Island. There was an excellent harbor sheltered from rough waters of the gulf by Pelican Island still further south. Ships could enter this harbor by way of a twenty-one foot channel. There cargo was unloaded and transferred to river boats and transported to the city. Sailboats could navigate the bay, but beyond that, pirogues and flatboats had to be utilized.

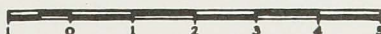
A great storm such as often occur on the Gulf Coast hit Dauphin Island in March 1717, and filled the channel with sand to a depth of only ten feet. Henceforth ships drawing over ten feet of water could not enter the harbor. For the next century and a half, ships had to anchor in the Gulf beyond Mobile Point and transfer their cargoes in the open sea. Mobile Bay tends to average only nine to twelve feet in depth. Even this depth was obstructed by two bars, Choctaw at McDuffie Island and Dog River bar, which had depths of only four or five feet at low tide. Mobile was landlocked except for those vessels drawing only four or five feet of water. In spite of this handicap, Mobile exported hundreds of thousands of bales of cotton and lesser quantities of other products.

The initial project for the improvement of Mobile harbor was an appropriation in 1826 to be used for the removal of obstructions from



MOBILE BAY & ADJACENT WATERS

AN ACTUAL SURVEY IN 1820 BY CURTIS LEWIS OF ALABAMA



DIRECTIONS FOR COMING INTO THE BAY OF MOBILE AND THE TOWNS OF MOBILE AND BLAKELEY, ALABAMA:

In running in for the land or Bay of Mobile, should you make it to the westward of the bar, the land will appear broken, as it consists of small islands, which occasion several small openings. If to the eastward the land is uniform as far as Pensacola east, covered with timber, the beach generally sandy and quite perceptible in clear weather for 8 or 10 miles distant. Dauphin Island to the west of the bay, appears high and bluff. Mobile Point appears low and sandy, with a single tree on the extremity, in the form of an umbrella, and is thinly wooded for 5 miles from the point. On both Mobile Point and Dauphin Island there are houses.

Before you shoal into 7-fathom water, bring Mobile Point to bear NW 1/2 W and the east end of Dauphin Island to bear NNW 1/2 W, and steer in NNW. This course will run you over the bar on which you will have 16 to 20 feet of water in good tides. After passing a small sand island to larboard you are over the bar and out of danger, with a shoal to each side. Haul up for the Point of Mobile, giving it a berth of 300 to 400 yards, then steer up the bay as tracked on this chart.

It is necessary to calculate for the bay currents, as there is a westward drift on flowing tide, and to eastward on ebb tide, until you get to Dog River Bar, which extends across the bay. When in 11 feet of water, 2 1/2 miles from the western shore, 7 miles from Mobile and 15 miles from Blakeley, come to for a pilot.

Mobile harbor, but due to the shortage of personnel, the funds were placed at the disposal of the mayor and aldermen of the city. A year later no report of activity had been received from Mobile.⁷ Though the harbor was neglected, surveys were made by the Topographical Engineers with a view of connecting Mobile Bay and Pensacola Bay by a canal.⁸ This would extend the inland waterway from New Orleans to Pensacola by way of Mississippi Sound.

The 1828 appropriation bill included funds for deepening the channel through Pass au Heron and for deepening the channel through Choctaw Bar below Mobile harbor to a depth of ten feet. Funds which had been placed on deposit for use by the city were transferred back to the Corps of Engineers and the officer in charge of fortifications construction at Mobile Point was assigned to direct the projects.⁹ Despite the heavy duties of Lieutenant Ogden, he was able to negotiate contracts and get dredges in operation on both projects. He was responsible for too much to keep close check on the civil projects, however, and failed to report on their progress.

Captain Chase, superintending engineer for the entire Gulf of Mexico Frontier, did report in 1829 that the work at Pass au Heron was progressing on schedule and should be completed by March 1830. When completed, the channel would accommodate any vessel that could navigate Lake Pontchartrain. Pass au Heron was the only obstacle along the New Orleans to Mobile waterway by this time. Chase had just completed a survey of all channels and islands between Mobile and New Orleans and had chartered a course which would permit navigation between the two ports without having to take to open waters. He had also marked locations for needful lighthouses and bouys.¹⁰

The work at both Pass au Heron and Choctaw Bar suffered reverses. The dredge employed at Choctaw Bar operated 1 April-10 September 1830, and then had to be withdrawn for repairs.¹¹ By this time the channel had been completed 250 yards 80

feet wide to the required 10 foot depth. Storms and a breakdown in equipment disrupted the work at Pass au Heron, so it was not completed by the scheduled 1830 date.¹²

Work on Choctaw Bar progressed slowly with many interruptions. The contract had been let to Charles Bingham of Mobile. He did not have the resources to adequately execute the project, and in 1834 requested that he be released of his contractual obligations. William Chase, officer in charge, Ogden having recently been transferred to the Cumberland Road in Indiana and Illinois, had no authority to void a contract. He relayed the request to Gratiot, who, in turn, relayed it to Lewis Cass, Secretary of War. Cass refused to release Bingham, insisting that Bingham could realize a fair profit from his contract. He instructed Chase to institute legal proceedings against Bingham.

Chase, on the assumption that the contract would be voided, had already engaged a Mr. Mifflin to repair government-owned equipment and proceed with the dredging. Upon the receipt of the instructions from Cass, Chase explained that Bingham did not have the necessary resources to repair the dredging equipment, stating that he was a poor man. Mifflin did have the resources and was a capable man. He suggested that Bingham be permitted to transfer his contract to Mifflin.¹³ This was done, and the Choctaw Bar project progressed thereafter.

By the close of the 1833-1834 fiscal year, a channel 10 feet deep had been completed. Now vessels drawing no more water than 10 feet could navigate directly to the Mobile harbor. There was a serious problem of vessels passing during winds, however, and the project was expanded to dredge the channel to a width of 300 feet. Though Mifflin reported many interruptions in his work, the project was progressing satisfactorily during 1835. By the close of the fiscal year, he had added an additional 50 feet to the width of the channel and hoped to increase it to a 200-foot channel by 1 January 1836.¹⁴ Chase was pleased with the work of Mifflin and requested that he be permitted to continue the project after the original contract had

expired. Chase promised to push the work which had progressed so slowly since its beginning in 1826.¹⁵

The project had not seen the last of its difficulties, however. A storm damaged the equipment beyond repair in November 1835, and Mifflin was forced to give up the project. A contractor from New Orleans expressed willingness to undertake the work and Chase opened negotiations with him. This meant further delay in the project. The contract was not signed until October 1836 and was annulled in June of 1837, due to the failure of the contractor to perform. Another was signed shortly thereafter with promise that dredging would begin in December.¹⁶

During the period, 1830-1836, the Federal Government made generous appropriations. The annual budget for the Corps of Engineers had increased from \$520,150 in 1823 to \$3,643,271.76 in 1836. The same Congress which had become so generous in its appropriations of funds still refused to approve increases in personnel. The clerical help was inadequate and salaries for those employed by the Corps of Engineers were not comparable to those in other branches of the military. Gratiot recommended in 1836 that additional clerical help be provided and that the size of the Corps be doubled so that it could adequately direct the expenditure of the appropriations.¹⁷ Before Congress had responded to Gratiot's request, the economic panic struck in 1837, and there was a retrenchment during the period of depression following the panic.

The contractor did continue the work on Choctaw Bar, but accomplished little. A contract was let to dredge Dog River Bar, but it was annulled for lack of performance.¹⁸ Despite appeals from General Joseph G. Totten, who had replaced Gratiot as Chief Engineer, Congress refused to make reasonable appropriations to carry on either military or civil projects in 1839.¹⁹ The appropriation for civil projects in 1840 nationwide was only \$22,541 for harbors and rivers, \$32,191 for roads, and \$9,897 for lighthouses. This required a considerable retrenchment and work on many projects was suspended.²⁰ Work on civil projects in the Mobile District came to

a virtual halt. The military projects fared little better. Appropriations were made late in the fiscal year and then restrictions were placed upon them due to the state of the treasury. This was General Totten's second year as Chief Engineer, and he found the entire Corps almost inactive due to a lack of funds. Officers were urged to exercise strict economy in the public interest. Scrupulous attention was ordered concerning the quality of workmanship and materials. The depression following the 1837 panic had really settled upon the nation. No real progress was made on the improvement of Mobile harbor or Pass au Heron after 1840 until after the Civil War. An act of Congress appropriated \$18,000 for the improvement of Pass au Heron in 1828, and the money was expended by 1832, but with what results were not recorded. The Alabama Legislature awarded a monopoly to John Grant in 1839 to dredge and maintain a channel connecting Mobile Bay and Mississippi Sound. This channel served until after the Civil War.

Work on Mobile Bay was suspended for lack of funds in 1840 and all efforts to reactivate the project suffered delays. An appropriation was made for a survey of the bay in 1844,²¹ but the report of 1845 reflected no work on the project. In 1846, the Topographical Engineers were pulled off all civil projects and attached to the armies to assist in the Mexican War. The limited activity on civil projects was suspended again.

By an act of Congress 3 March 1847, the construction of lighthouses was placed under the direction of the Topographical Engineers. Lighthouses had been erected without proper regard for their positions and the action of the sea upon their foundations. This was probably the reason for placing the engineers in charge of future construction. Since the lighthouses in the Mobile District had already been constructed, that added responsibility did not affect the area for some time.

Need for improvement of Choctaw Bar and Dog River Bar was noted in the 1852 report, but no action was taken. Shortly thereafter, Major William H. Chase completed a survey

of Mobile Bay, and contracts were let for the construction of a "powerful" dredger and the necessary scows. Another contract was let for the removal of a large amount of obstruction material from the harbor. A severe epidemic of yellow fever disrupted progress on both contracts.²²

Finally, dredging got under way again, but little progress was made. By the close of fiscal year 1855, 40,725 cubic yards of mud had been removed from the Dog River Bar, deepening the channel one foot. Machinery had been inactive since 3 March of that year however. No further progress was reported before the Civil War. Thirty-five years after the initial appropriation in 1826, all that could be reported was a 10-foot channel through Choctaw Bar and the removal of some obstructions. The total usefulness of the harbor had been only slightly improved. Real progress would be accomplished in the post Civil War period when there was a time of prosperity and a more favorable political climate for internal improvements.

There is no record of work being accomplished on the Mobile, Alabama, Tombigbee River system. Those rivers were the life line for getting produce to market for a large portion of Alabama and a limited area in east Mississippi. The period between 1826, the date of the first appropriation for civil projects in the Mobile District, and the Civil War saw steamboat traffic mature on the rivers. The first steamer in the Mobile area was the *Alabama* built in St. Stephens in 1818. The engine was not powerful enough to carry the boat against the currents. It proved impractical for river traffic. In 1819, the *Mobile* ascended the Tombigbee to Demopolis. The boat had to stop often so vines and branches could be cut so it could pass. The next to ascend the river was the *Harriet*, which made the trip up the Alabama to Montgomery.²³ Thereafter the river traffic continuously increased.

The coming of the river steamboat did not eliminate the flatboats. They could bring large cargoes downriver, but were not practical for ascending the river. A flatboat trip upriver from Mobile to Montgomery once took

three months.²⁴ The only way such a vessel could navigate the river was by poling in shallow water or by warping the boat along by pulling on a rope around a tree upstream. The flatboats usually made a one-way trip. At the end of their journey they were usually dismantled. Sometimes their planks were used for street curbs, but sometimes were sent to the West Indies where there was a demand for lumber. With the coming of the steamboat, flatboats were utilized less and less.

The steamboat brought increasing need for river and harbor improvement. The boats often were broken by snags in the rivers. The cold waters hitting the red hot boilers resulted in explosions and great loss of life. To clear the rivers of snags became a matter of major concern for the safety of crewmen and passengers as well as for economic reasons.

An act of 2 March 1827 appropriated \$8,000 for improvement of the harbor at the mouth of Pascagoula River and for removal of obstructions from the river. Of all rivers in the deep south, Pascagoula River was best suited for navigation for a river of its size. The banks tended to be straight and steep and little given to change. The river bed was kept swept clean and relatively constant in depth. There was little problem of fallen trees and sand bars. The mouth of the river presented a different story. A boggy mud silt formed a bar with only four or five feet of water covering it. Doubt was expressed that the efforts to improve the bar would produce desired results, because the mud flowed back into the channel.

The Pascagoula was an important means of transportation, however, and its improvement would make a significant economic impact on a large portion of southeast Mississippi. When, in 1806, the Spanish officials closed Mobile River as a means of getting military supplies from New Orleans to the United States port of entry at Fort Stoddard, a military commission was sent to explore the use of the Pascagoula for that purpose. Just how successful the mission was is not known since the river was in Spanish territory and its use by Americans was kept secret.²⁵

The United States gained control of the Pascagoula in 1810, and it was thereafter used as a means of transporting produce to the Gulf. Major Howell Tatum, Jackson's topographical engineer, reported in 1814 that the Pascagoula was formed by the junction of the Chickasawhay and Leaf Rivers 109 miles from the Gulf. Any vessel which could cross the bar at the mouth of the river could ascend to that junction. Vessels drawing no more than five feet of water could ascend the Chickasawhay an additional 130 miles to the mouth of Buckatunna Creek just below Waynesboro, Mississippi. Leaf River could be navigated by the same type vessel for 60 miles above the junction. Those two rivers were destined to be improved so that traffic was possible to Enterprise, just south of Meridian, on the Chickasawhay, and to Hattiesburg on the Leaf River.

The Mississippi Legislature set up a commission in 1818 to conduct a lottery to secure \$3,000 to improve the three rivers. There is no evidence that significant improvements were accomplished as a result of this act. An estimated 1,000,000 bales of cotton were exported, however, by way of Pascagoula between 1819 and 1855, when the Gulf Mobile and Ohio Railroad opened.

The Corps of Engineers was given responsibility for the improvement of the harbor at the mouth of the Pascagoula River by an appropriation of \$8,000 in 1827. The funds were also to be used to remove obstructions from the river. Removal of obstructions presented no real problem, but doubt was expressed from the beginning that efforts to cut a channel through the mud bar at the mouth of the river would produce the desired results.²⁶

Additional funds were appropriated the next year, and the contractor working on the Pass au Heron channel had also contracted to dredge the Pascagoula bar channel, but storms and breakdowns of machinery delayed his work.²⁷ The contractor had moved about 5000 cubic yards of earth from the bar by 5 August 1830, when he was forced to stop operations because of strong easterly winds. The dredging was transferred to Pass au

Heron, where islands protected the equipment from damaging waves.²⁸ For the next four years little progress was made. The work progressed so slowly and unsatisfactorily that Chase, the officer in charge, instituted legal action and abrogated the contract. The new contractor soon had a channel 45 feet wide and 5½ feet deep cut through the bar. He expressed fear, however, that the channel would fill.²⁹

The contractor's fears proved well founded. The channel quickly filled in to a depth of four feet, and there was doubt that it would hold even that depth. He concluded that a four-foot channel was the greatest depth that could be achieved. Added to the problem of the channel filling, strong winds and breakdown of machinery further delayed progress.³⁰ The project was declared a failure in 1837, and operations were suspended. The money which had not been expended was returned to the treasury.³¹

Pascagoula bar does not appear in the records again until it was reported in 1852 that surveys and studies were in progress with hope that work would begin in the near future. The final report was not given until 1855. It concluded that a 6-foot channel 100 feet wide could be opened through the East Pascagoula River Bar.³² No action was taken to reactivate the project before the Civil War.

A number of other civil projects were initiated in the Mobile District before the Civil War, but like those already discussed, results were not outstanding. A survey was accomplished by the Topographical Engineers in 1826, with a view of connecting Mobile Bay and Pensacola Bay by a canal.³³ The project was not accomplished until the post Civil War era. Saint Marks, Florida was surveyed in 1829, and an appropriation was made to initiate a project for the improvement of Apalachicola River in 1830. The \$2,000 appropriation proved insufficient to secure the necessary machinery for the project. Additional appropriations were made and by 1832 a channel four feet deep had been dredged. Work on the Apalachicola River was considered complete insofar as success

could be realized. All obstructions had been removed and all trees along the banks which might fall causing additional obstructions had been cut. The Apalachicola harbor had been cut to a depth of 10 feet despite labor problems. The engineers reported that rather than filling, the channel had been swept to 12 to 14 feet by the currents.³⁴

Obstructions were removed from the Ochlockonee and Escambia Rivers before the Panic of 1837 caused the civil projects to be suspended. Only one road was listed in the annual reports in the Mobile District. A road 45 miles long was constructed from Line Creek to the Chattahoochee River in Alabama during the early 1830's. The agent in charge negotiated a contract for the full amount of the appropriation, not taking into account that his own compensation must come from it. The project was completed \$1,544.50 in arrears. A request was made that the sum be provided in the 1836 appropriation.³⁵

General Joseph G. Totten ordered Captain Jeremiah M. Scarritt, officer in charge of the Mobile area, to move from Fort Morgan to Mobile and establish an office there.³⁶ From that time on, officers have lived in Mobile and have maintained an office from which the activities of the Mobile District have been directed. It is assumed that the Corps constructed the Custom House across the street from the Battle House Hotel in Mobile. The building was constructed of granite imported

from New England. The foundation was made of pilings driven deep into the sandy soil. Cost of the structure was \$360,000.³⁷ It was built about 1852. Records of the construction have not been found, however, within the scope of this research.

An act of Congress, 16 July 1798, provided for the establishment of marine hospitals to be located in port cities. Under the provisions of that act, land was acquired by the Corps of Engineers in Mobile in 1837, and a marine hospital constructed on it. The hospital opened in 1843. It was situated on a six-acre tract and was enclosed by a high brick wall. In 1902, the name was changed from Marine Hospital Service to Public Health and Marine Services. In 1912 it was changed to Public Health Service. It suspended all marine services in 1952. The building was still standing at the time of writing and was in a good state of repair.³⁸ Robert Miles is attributed to have designed the building, but, as is true of the Custom House, records of construction have not been found.

The pre-Civil War work of the Corps of Engineers was primarily military in the Mobile District. The engineers were trained in the Military Academy at West Point and were first and foremost military men. The post-Civil War era saw a great change in the operation of the Corps. The civil projects received nearly all the attention for some decades thereafter.

CHAPTER VI:

THE GREAT ERA OF RIVER AND HARBOR IMPROVEMENTS: 1865-1917

The post-Civil War era saw a boom in internal improvements including railroad construction and river and harbor projects. At first the bulk of the projects were in the North and West. The South was under military rule, and the economy was universally depressed. It was ten years after the Civil War before agricultural production reached that of 1860. Not only that, but the South was void of national political power for several years. The South was neglected; however, in the development of internal improvements. These were directed by Corps of Engineers officials assisted by civil engineers.

Secretary of War Edwin M. Stanton, secretary in Lincoln's cabinet, reorganized the War Department. He added three major bureaus during the Civil War: the Judge Advocate General's Office, 1862; the Signal Department; and the Provost Marshal General's Bureau in 1863. The latter bureau was established to administer the draft act recently passed. The same year he merged the Corps of Topographical Engineers with the Corps of Engineers, ending its separate existence. The vast survey and other responsibilities were now integrated with the work of the Corps of Engineers, which had considered itself more militarily oriented. The Corps assumed major responsibility in surveying and opening western lands.

By 1868 the Corps was beginning to engage in some civil projects in the South. The Mobile District was under General M. D. McAlester, who was assigned to construction of fortifications, harbors, and river improvement. He was stationed in New Orleans, no office having been opened in Mobile since the Civil War. Considerable work was in progress in the vicinity of New Orleans and some in Texas, but no civil projects were reported in the Mobile District. Other projects in the South were on the Tennessee River and at Key West. The next year saw little change. There was an authorization for some survey work to be accomplished during the

1870 fiscal year. The Mobile office reopened in 1870 with Major C. B. Reese in charge. He died of yellow fever on the eastern shore of Mobile Bay 22 September 1870. It is assumed that he had resorted to the higher pine-covered land of the eastern shore to avoid the fever epidemic, believing that this location was free of the fever.

Major Reese was succeeded by Captain Andrew N. Damrell until the arrival of Colonel John H. Simpson on 12 December 1870. Colonel Simpson, officer in charge, was assisted by Major Walter McFarland.¹ Colonel Simpson was replaced by Colonel W. F. Reynolds in 1872 who served until 1873.

The Mobile District extended from the St. Marks River, Florida, in the east to Pearl River in the west when the Mobile office opened in 1870. Its civil responsibilities included, therefore, northwest Florida, most of western Georgia, all of Alabama except the Tennessee Valley, and all Mississippi from the Pearl River watershed eastward. This included most of that state.

Captain Damrell became District Engineer in 1873 and was destined to be one of the District's most distinguished leaders. He resigned as District Engineer in 1895 due to ill health, but served on the lighthouse board for several years before his final retirement from the Corps. He made Mobile his retirement home and descendants still reside in the area.

Damrell was a native of Massachusetts and was appointed a cadet from that state 1 July 1860. He graduated in June 1864, was commissioned a Second Lieutenant upon graduation and was assigned to Franklin, Tennessee. In 1865 he was transferred to duty in New Jersey where he directed the construction of the fort at Sandy Hook. He arrived in Mobile in 1869, where he remained for the rest of his life. Damrell, more than any other person, was responsible for Mobile

Harbor and the Mobile Bay channel. It was during his career that river transportation reached its most active era. The era was initiated before the Civil War, but extended well into the twentieth century.

Among the floating palaces that plied the Alabama rivers were *The City of Mobile*, *Fashion*, *Sunny South*, *Southern Bell*, *Magnolia*, *Hattie B. Moore*, and the *Eliza Battle*. Some of those were before the Civil War, but were typical of the floating palaces. The *Hattie B. Moore* was built in Mobile in 1884. Rittenhouse Moore was principal owner and the boat was named for his daughter, Hattie. It was fondly called "Red Headed Hattie" by the crew because of its bright red smoke stacks. It was also referred to as "Fast and Fancy Hattie with the Red Smoke Stacks." It was condemned in 1900 and anchored opposite the Mobile City wharf. The hurricane of 1906 destroyed it.²

The *City of Mobile* was built in 1898. It was a 209-ton steamer capable of carrying over 300 tons plus passengers. There were 73 berths and 25 staterooms. The boat carried 139 life preservers and two lifeboats. The log book under dates 25 September - 1 October 1912 stated that the *City of Mobile* deposited freight from Mobile at over 100 landings up the Mobile, Tombigbee and Warrior Rivers.³

In addition to the above mentioned, there were scores of other boats plying the rivers regularly. They deposited or picked up cargo at landings all along the river banks, usually at larger plantations or urban communities. Upon approaching the landings, the steam whistle would let out a shrill blast to notify the surrounding area of the boat's approach. There was usually a good turnout at each landing.

The Apalachicola River system was as busy as the Alabama rivers. That system includes the Chattahoochee, Flint, and Chipola Rivers. An estimated 200 boats navigated the Chattahoochee. There were nearly 200 landings on the Chattahoochee, 67 on the much shorter Apalachicola, 26 on the Flint and 7 on the Chipola. The *Apalachee*, *Calhoun*,

Chattahoochee, *Chipola* and *W.S. Holt* were among the more famous boats.

In addition to the commercial boats on the rivers, the Corps of Engineers accumulated and operated many boats. They included floating dredges, snagboats, towboats, barges and derrick-boats. The rivers in their unimproved state were not navigable for most of the commercial or work boats. It was a primary concern of the Corps of Engineers to create channels as free of danger as possible. This included removing snags, logs, loose rocks, and sand bars and other obstructions. It was necessary to construct jetties and wing dams to protect channels or to force water through channels to keep them swept clean. In many instances channels had to be dredged deeper.

The great loss of life and property made the cost of improvements appear small by comparison and commerce was greatly enhanced as a result of the opening of the channels. The *Eliza Battle* burned about one-half mile above Kemp's landing on the Tombigbee 1 March 1858. This was a floating palace operating out of Mobile and was owned by the well known Battle family. It carried many passengers and a cargo of cotton and other items. The river was flooded, and the captain was greatly concerned about being able to detect the channel in the darkness and keep the boat from becoming grounded. It was fire, however, which destroyed the boat. Fire broke out on the deck, and rapidly swept across the boat. Passengers were forced to abandon the boat. Some pushed bales of cotton into the river and used them as rafts. Others simply jumped into the icy river; and when the casualties were totaled the next morning, it was learned that 36 lives had been lost from drowning, exposure and from the fire.

The *Orline St. John* sank in the Alabama River 4 March 1850. It burned to the waterline and then went down. This 349-ton side wheeler carried a crew and 50 passengers in addition to its cargo. The cargo and 41 lives were lost. The *Captain Sam* exploded and sank some 12 to 15 miles below Montgomery in 1895 and 13 lives were lost. Other wrecks

in the Alabama River near Montgomery were the *Autauga*, 1865, the *J. C. Blackford*, 1871, and the *Henry King, Jr.* 1865.⁴ There were many others in the Alabama River.

The channel on the Chattahoochee from Columbus, Georgia to the Gulf of Mexico, a distance of 360 miles, was called the longest graveyard in Georgia. The river became increasingly hazardous as one ascended it. The terrain became more stony and loose rocks in the river channel were a continuous problem. The problem in all the rivers was compounded by the presence of the wrecked vessels. Boats often struck submerged wrecks and sank. The Corps of Engineers was responsible for removing the hazards of whatever nature insofar as possible.

The Corps of Engineers was reorganized in 1888. Secretary of War, W. C. Endicott, issued general order No. 93, authorizing the establishing of divisions within the Corps, each headed by a Division Engineer. Chief of Engineers Brigadier General T. L. Casey, was authorized to assign as many officers, not below the rank of Lieutenant Colonel, as might be needed as Divisional Engineers. By terms of the order, those Divisional Engineers were to exercise care and oversight over the engineering projects within their divisions. The Mobile District fell in the newly established Southeast Division. The Mobile District was divided in 1888 and the Montgomery District was created from the eastern portion.⁵ The Escambia River, Florida, became the dividing line between the districts. Captain Damrell remained in charge of the Mobile District and Captain R. L. Hoxie was appointed District Engineer for the Montgomery District. This remained the organizational structure until the two districts were rejoined to become the Mobile District again in 1933.

The first civil projects initiated after the Civil War were river surveys. They will be discussed later. The most important single civil project was the Mobile Harbor and ship channel, and Captain Damrell devoted serious attention to it. The last significant appropriation for the improvement of Mobile Harbor before the Civil War was made in 1852. That brought the expenditures on Mobile Harbor to

\$207,997.60 and resulted in a channel 10 feet deep, 200 feet wide. An additional appropriation was made by Act of Congress 3 March 1857 totaling \$20,000. No further appropriations were made until \$50,000 was appropriated 11 July 1870 to initiate another improvement project for the harbor.

The 10-foot channel at Choctaw Pass had shoaled to seven and one-half feet by 1860, though the Dog River Bar channel had remained constant. From 1860 to 1870 no work was accomplished on the channel by the Mobile District. The Alabama Harbor Board was active however. It was engaged in removing Confederate obstructions from the rivers flowing into Mobile Bay. The board also removed a number of wrecked vessels from the channels. It had further employed the services of Confederate General Braxton Bragg to formulate a plan to improve the harbor.

Bragg's plan called for the construction of a dike and jetties practically closing the Tensaw and Spanish Rivers, and forcing the water to pass through the harbor at an increased velocity, scouring the river banks and bottom. The dikes were constructed, and functioned as Bragg had predicted, but the system only created additional problems at Choctaw Pass. All the silt and debris of the entire water system was forced through the harbor and when the flow slowed as it reached the bay, the bar at Choctaw Pass simply built up that much more rapidly. The problem had always been with Choctaw and Dog River Bars, not the harbor itself, and Bragg's project only aggravated the situation.

Captain Damrell took issue with Bragg's solution to the problem. There were those who defended Bragg's work and the situation developed into an issue. The work of an illustrious Civil War general was questioned by a young recently imported Yankee. The Alabama Harbor Board was disposed to defend Bragg's position when Damrell recommended that the project be abandoned and that dikes already constructed be destroyed. The dispute culminated in the appointment, by the State of Alabama and the Corps of Engineers, of a board of engineer officers representing both parties.

The Corps of Engineers was represented by Colonel J. H. Simpson, Lieutenant Colonel Z. B. Tower, and Lieutenant Colonel H. G. Wright. Captain Damrell acted as recorder for the board. The State of Alabama was represented by General Bragg and Percy Walker. Walker was secretary. The board was called the "Board for the Improvement of the River, Harbor, and Mobile Bay." It entered discussion and correspondence, and eventually produced plans which were acceptable to both the Corps of Engineers and the State Harbor Board. The Alabama Legislature abolished the Harbor Board in 1873, giving the Corps of Engineers a free hand.⁶

Bragg's dikes and jetties were demolished and Damrell let contracts for dredging to Captain John Grant and S. N. Kimball and Company of Chicago, Illinois, each working on different segments of the project. They were paid 39.5 cents per cubic yard for sand removed. The project called for a channel 13 feet deep and 300 feet wide. There were appropriations annually through 1875, totaling \$401,000.

Mobile was a port of entry for foreign imports and collected \$1,097,164 in tariff revenue in 1873. That year 213 vessels arrived with 88,514 tons of cargo. There were 195 vessels clearing port with 88,206 tons of exports. Value of exports was nearly \$13,000,000 with \$3,860,636 being exported in domestic ships and \$9,114,479 in foreign ships. Captain Damrell observed that the appropriations for improvements were profitable expenditures.

Captain Damrell negotiated new contracts in 1874 for dredging the channel. John Grant was awarded the contract for the Dog River bar at 23 cents per cubic yard. J. E. Slighter was low bidder for Choctawbar at 45 cents per cubic yard. Dredging progressed with some interruptions due to flood waters. A torpedo boat, probably a Civil War casualty, was removed from Choctaw Pass, but another wreck still endangered traffic. The project was completed under those contracts. In 1877, a channel 13 feet deep extended all the way to deep water. It was 300 feet wide at Choctaw Pass and 200 feet at Dog River bar. As of

September of that year, no change had occurred in the depth of the channel. This channel still left much to be desired, however. Ships crossed the outer bar which had a depth of 21 feet, and then had to anchor 27 miles from Mobile harbor and receive the bulk of their cargoes at increased expense and probability of damage to freight. Damrell felt that the importance of the Port of Mobile justified increasing the depth of the channel to accommodate larger vessels. He requested an appropriation to accomplish a survey to this end.⁷

His request was granted and a new project was initiated which resulted in a channel 17 feet deep and 200 feet wide. Bids were advertised and opened 20 May 1880.⁸ All were considered too high and no contract was let. He called for bids again and a contract was let to George C. Forbes of Baltimore, Maryland, at 12.3 cents per cubic yard. This was only half the lowest price of the previous bids. Contracts were let annually thereafter until 1886. Contractors in order of service were G. L. Long, R. More, and Tobias Burke, all of Mobile. Prices ranged from a high of 12.3 to a low of 9 cents per cubic yard. Technological advances in equipment resulted in drastic reduction of cost for dredging. It had dropped from a high of 45 cents per cubic yard to a low of 9 cents in 1886. By 1911 contractors bid as low as 5.38 cents per cubic yard, though several factors determined how low they could go, such as nature of soil removed and how far it had to be moved.

The 17-foot channel was accomplished by the project initiated in 1880 and completed in 1886. Another project was initiated to accomplish a 23-foot channel by an act of Congress 11 August 1888. The channel was dredged to 280 feet at the top of the cut and extended from the Gulf of Mexico to Chickasaw Creek. This channel was completed in 1896. The bottom of the channel was only about 50 feet wide. To improve its usefulness, a project was initiated in 1899 to accomplish a channel 23 feet deep and 200 feet wide with appropriate slopes. This project was completed in 1901. A channel now existed with a minimum low water depth of 20.5 feet. Ships could navigate the bay to Mobile Harbor with a 21-foot maximum draw entering and departing at high

tide.⁹ The improved channel was reflected in the amount of cargo transported. Imports and exports, foreign and domestic, for 1901 was 1,616,446 tons valued at \$28,482,331.

The Mobile Bar project was initiated in 1902. It provided for the dredging of a channel 300 feet wide and 30 feet deep across the bar at the entrance of Mobile Bay. Work continued on that project until its final completion in 1914. This channel would accommodate any vessel that could navigate the Mobile Bay Ship channel until post-World War I projects would increase that channel.¹⁰ The work was accomplished by a government-owned dredge boat and day labor. Further effort to improve the bar was the removal of the sunken ship *Indian Chief* that had sunk about 1872. During fiscal year 1916, 35 tons of railroad iron was removed from the wreck.

In 1906 one of the most destructive hurricanes of Gulf Coast history to that date hit Mobile. The channel shoaled to as little as 17 feet in some places. Appropriations of 1907 provided for dredging the channel to its previous depth and for the removal of numerous trees, logs, timbers, and other dangerous obstructions, most of which were a result of the storm.

The last pre-World War I project was initiated in 1910. A channel 27 feet deep at mean low water and 200 feet wide was accomplished; a channel 33 miles distance from deep water to Chickasaw Creek above Mobile Harbor. This channel, along with the 30-foot channel through Mobile Bar, now opened the port of Mobile to vessels drawing as much as 28 feet by arriving and departing at high tide. The work was accomplished by a government-owned hydraulic pipeline dredge. A government-owned snagboat was kept on the job most of the year 1916, clearing the channel of obstructions.¹¹ Vessels utilizing Mobile Harbor in 1915 drew from 13 to 28 feet of water. The latest improvement opened the port to additional ships, but cargo clearing Mobile that year was down. It dropped from 2,392,442 short tons valued at \$58,085,903 in 1914 to 1,579,804 tons valued at \$46,440,771. The decline was due to World War I which had erupted in Europe late in 1914. Two

lines, the "Atlantic, Mexican and Gulf," and the "Sudden and Christenson" had discontinued calling on Mobile completely. Cargo clearing port were manufactured steel and iron, cotton and cotton products, grain, lumber and timber, naval stores, pork, coal, stoves, crossties, and crude molasses. By the opening of World War I, Mobile had greatly increased in its importance as a port city. Freight and insurance rates had been lowered considerably due to the improved facilities now available to commerce.

The Apalachicola Harbor was also improved. A group of concerned citizens petitioned the Corps in 1872 to initiate a project to improve the Chattahoochee-Apalachicola River system and the Apalachicola Harbor. The petition was signed by Samuel Benezet, Mayor of Apalachicola, the city councilmen, the president of the local Chamber of Commerce and the president of the Atlantic and New Orleans Steam Navigation Company. It was further signed by 136 local citizens. Pre-Civil War traffic was reviewed to strengthen justification for such a project. During the period 1 September 1859 - 1 August 1860 cargo valued at \$14,000,000 cleared the port. Imports included salt, molasses, and sundry packet freight. Exports were largely cotton, which was shipped to Liverpool, Gibraltar, LeHarve, and St. Petersburg, Russia. That year the port experienced its most disastrous fire. A cargo of 2171 bales of cotton, valued at \$258,610 burned at anchorage prior to shipment to Antwerp.¹² The petition was followed by appropriations, and a harbor improvement project was accomplished in succeeding years.

The Apalachicola Harbor and bar were improved, but it was destined not to develop into a major port. Vast reaches of swamps and marshes made it almost inaccessible by road and rail. The same was true of Carrabelle and Port St. Joe, Florida. Port St. Joe had the finest natural harbor of northwest Florida, and one of the best on the Gulf of Mexico, but its remote location prevented any significant development. With a natural depth of 30 to 36 feet and a 20-foot depth over the bar, Port St. Joe was considered as a possible site for the naval base. The marshy nature of

Gulfport, Miss., February 19, 1913.
View of basin from outside. Taken from Chickasaw.



SHIPPING IN GULFPORT HARBOR, 1913

the interior caused naval authorities to choose Pensacola instead. Those harbors were improved sufficiently to meet commercial needs.

The two Florida ports which were improved significantly were the Panama City and Pensacola harbors. Panama City was afforded a 22-foot channel by way of East Bay. The project was authorized in 1910 and completed in 1914. Shoaling necessitated additional dredging, and the dredge *Charleston* was transferred to Panama City and dredged the channel in 1916, utilizing hired labor.

The cargo clearing port in 1917 consisted almost totally of timber. The steamer *Mary*, formerly of the Flint River, did make weekly calls on St. Andrew Bay and Apalachicola River landings. It carried packet freight and passengers. The launch *Swan* and the steamer *John W. Callahan, Jr.* also served the area.

Pensacola Harbor improvements revolved around the requirements of the naval base. Acts of Congress in 1878, 1894, and 1899 authorized improvements which resulted in a channel 30 feet deep over the bar by 1916. Several wrecks had to be removed from the channel and harbor area. The project was completed in November 1916 by the dredge *Caucus*. Pensacola was more active than other west Florida ports. Cargoes included coal, cotton, grain, fertilizer, lumber, timber, mahogany logs (imported), naval stores, tobacco, steel billets, chalk, and miscellaneous packet freight. Launches which made regular runs in the area included the *Ruth*, *Idell*, *Viola*, *Grand Rapids*, and the *Alma*. The schooner *Evelyn* and steamer *Natomah* also made weekly calls on the port and other points along Santa Rosa Sound.

The major projects along the Mississippi Gulf Coast were Pascagoula, Biloxi and Gulfport. In terms of economic progress, the Pascagoula project was doubtless the most significant. It has enabled that port to become one of the world's great ship-building centers. A multi-billion dollar industrial complex was destined to be constructed at Pascagoula, the largest being the shipyards. To accommodate the industries, a channel 40 feet deep and 350 feet wide was ultimately provided. A

turning basin 2,000 feet long and 950 feet wide was also dredged. A number of other channels and turn basins have been provided to meet the industrial needs of the community. Over \$6,500,000 had been spent on the project at the time of writing. Biloxi has been provided a 12-foot channel 100 feet wide. That has met the needs of that harbor to date.

The Gulfport Harbor and Ship Island Pass was a project of some magnitude. Originally no channel existed between the anchorage at Ship Island and Gulfport. Water ranged from 2.5 to 19 feet deep over the site where the channel was projected. The basin and channel at Gulfport are not at the mouth of any rivers. To achieve the channel projected before 1917 required dredging the anchorage basin and a channel 7 miles long as well as the Ship Island Bar. By the close of the fiscal year 1916, a channel 12.5 feet deep had been achieved and a 22.6-foot channel had been accomplished across the Ship Island Bar. While this was no deep harbor, cargo in excess of \$7,000,000 was exported from Gulfport in 1913, with some decrease in succeeding years. The 1915 exports were 84.7 per cent lumber and timber, but did include naval stores, cotton, phosphate rock, iron pyrites, and general merchandise.

River improvement projects progressed alongside the harbor improvements. They were initiated in 1870 when Major Reese appointed a civilian, H. C. Fullebrown¹³, to survey the Coosa River in Georgia and Alabama, and Thomas Pearsall to survey the Apalachicola assisted by C. F. Trill. From those beginnings, every stream between St. Marks, Florida, and Pearl River that carried any cargo was improved. Among the most important projects in the Mobile District had been those to improve the Black Warrior, Warrior, and Tombigbee Rivers in Alabama. Those rivers have been vital to trade through the port of Mobile.

The name Black Warrior designated the river above Tuscaloosa. From Tuscaloosa to its junction with the Tombigbee, it is noted as the Warrior. Federal improvements extend to Mulberry and Locust Forks, a distance of 388 miles from Mobile as the area was meas-

ured in 1915. Some distance has been cut more recently by the Sunflower Bend cut-off. The original purpose of the improvement was to open transportation, largely downstream, from the rich coal mines, to accommodate the steel mills of the Birmingham area, and the vast number of floating palaces and other river boats navigating the system.

This river system in its unimproved state was navigable as far upstream as Demopolis, Alabama, about eight months of the year, and as far as Tuscaloosa about four months. There was no navigation above Tuscaloosa except at extreme high water, and then only by rafts. Before improvements, cargo consisted largely of rafted logs, lumber, cotton and other farm products and packet freight. All ordinary stages of navigation were rendered difficult by rock shoals, sand bars, snags and overhanging trees. Tuscaloosa was, for all practical purposes, the head of any really useful navigation.

The Mobile District initiated three separate projects to improve the system. These were later combined into one project. The object of the project was to obtain a channel six feet deep at low water from Mobile to Sanders Ferry at Mulberry Fork and to Nichols Shoals at Locust Ford on the Black Warrior River. To accomplish this channel 17 dams and 18 locks were constructed. At Dam 17, with an original lift of 63 feet, that lift was equally divided between two locks, 17 and 18.

The report of a Board of Engineer officers recommending a project for slack-water navigation was approved by Secretary of War William C. Endicott in 1887. The river and harbor act of 13 June 1902 merged the projects on the Black Warrior, the Warrior, and the Tombigbee Rivers. This project did not include the Tombigbee above Demopolis, however. The Tombigbee from Demopolis to Aberdeen, Mississippi, was improved as a separate project.

The first lock completed was lock 10 near Tuscaloosa, Alabama. It was 52 feet wide and 285 feet long, which was accepted as a standard dimension for the others. The depth

at mean low water over the low miter sill was six and one-half feet. The lift was 9.86 feet. It was completed in 1895. Locks 2, 3, 16 and 17, were put into operation in 1915, completing the project. The first real reflection of the facility in rates was the reduction of pig iron from Birmingham from \$2.75 per ton to \$1.75. The Alabama and New Orleans Transportation Company employed six self-propelling barges of about 1,000 tons cargo capacity in transporting coal from the Alabama mines to New Orleans. One of the largest coal mining companies in Alabama was constructing a fleet of barges to transport its coal in 1915.

When the Black Warrior, the Warrior, and the Tombigbee were combined into one project, the locks were numbered from the lowest at St. Stephens, Alabama, to Lock 17 at Kellerman. This necessitated renumbering those locks constructed under the original projects.

The purpose for the construction of the system of locks and dams was navigation only. Flood control was introduced later. The dams were only high enough to achieve the desired six-foot channel. As a result, boats would simply ride over the locks during high water. Some of the locks were manually operated, and it required considerable time to open and close them, but they were the forerunners of facilities to be accomplished later which have made this river system one of the most completely and best controlled in the nation.

Closely related to the above discussed project was the Tombigbee River improvement to Aberdeen, Mississippi. This river served no industrial cities, and was used by packets, flat boats and barges carrying farm produce, forest products, and packet cargo. Steamboat navigation was originally possible as far as Aberdeen, 199 miles above Demopolis, during high water. The low-water channel was 70 feet wide and one foot deep from Demopolis to Columbus, Mississippi. From Columbus to Aberdeen it was only 50 feet wide and one foot deep.

Work on this project was initiated in 1871. The original work was designed to clear



EXCAVATION FOR LOCK 3 ON THE TOMBIGBEE RIVER, AUGUST 1908

snags and overhanging trees only as far as Columbus. The project was modified and expanded to go on to Aberdeen in 1879, and eventually to Walker's Bridge, 169 miles from Columbus. From Columbus northward, effort was made to secure only a high-water channel by the removal of obstructions. After 1911, the work was restricted to the river below Aberdeen; since it was not profitable to maintain a channel further upstream. The nature of the improvement was temporary and the channel had to be reworked annually. The snagboats *Vienna* and *Tombigbee* were employed on the project and were manned by hired labor. They removed trees, sunken logs and other debris that might obstruct traffic.

The Alabama-Coosa River system was improved to Rome, Georgia. The upper portion of the Coosa was not navigated as much as the lower Coosa and the Alabama, and was one of the first to be abandoned as far as Corps projects were concerned. With modern barges and tugboats, there is a good chance that the river will again be improved to Rome.

The Apalachicola River and its tributaries, the Chattahoochee, Flint, and Chipola, were improved to accommodate the many boats utilizing them. As noted already, Captain Damrell surveyed the Apalachicola in 1871. Walter Griswold was contracted by the Corps of Engineers to survey the Chattahoochee from Columbus, Georgia, to its junction with the Apalachicola in 1873. M. J. Mack carried the survey on down the Apalachicola, updating Damrell's work.

The rivers had many shoals, sand bars and rock bars which needed improving and there were many loose rocks in the channels. By far the most serious obstruction was a row of piles placed across the Apalachicola by the Confederates about 37 miles above Apalachicola to prevent Union ships from ascending the river.¹⁴ Logs and other debris had drifted against the piles creating a dam. The flow of the river was diverted from its normal course and flowed through Moccasin Slough. Moccasin Slough flowed into the Styx River which, in turn, entered the Apalachicola a

few miles below the Confederate obstruction. The Apalachicola channel had become so completely clogged that it was simpler to improve Moccasin Slough and Styx River.

Boats leaving the river entering the slough had to make an extremely sharp turn. Once in the slough, there were overhanging trees, snags and shoals. It was the most difficult portion of the entire river to navigate, requiring many hours of hazardous work before re-entering the Apalachicola. The slough was improved and was utilized as the channel until on in the twentieth century.

The Chattahoochee was improved to Columbus, Georgia; Chipola to Marianna, Florida; and the Flint to Bainbridge, Georgia. The steamboat *Clara Dunning* was purchased by the Mobile District in 1875 and outfitted as a snagboat to work the Apalachicola River system. It worked Moccasin Slough during July and August and was then transferred to the Chattahoochee. During 1876 it worked the Chattahoochee to Columbus and the Flint to Bainbridge.¹⁵ Those rivers were made reasonably navigable, but no significant projects were accomplished on the river system until after World War II. The channels were kept open by a program of maintenance through the use of snagboats and dredges.

The other rivers of the Mobile District were improved in similar fashion from the unimportant Choctawhatchee River just west of the Apalachicola to Pearl River in the extreme western area of the district. The Choctawhatchee was improved to Buzzard Bar, about 15 miles below Geneva, Alabama. A 3-foot channel was achieved from Buzzard Bar to the Gulf. Plans to improve that bar and to remove wrecks, snags and sand bars on to the city were discussed, but appear not to have developed.¹⁶

The above type projects were repeated basically in all the rivers, many which appear so insignificant today were used to float large amounts of cargo to market. The improvements were achieved by removing fallen trees from the channel and overhanging trees from the banks, removing snags, logs, stumps and loose rocks from the channel, and by dredging and building jetties.

Extensive work of this type was accomplished on the Pascagoula River system, including the Leaf and Chickasawhay. More attention was given, however, to improving the harbor at Pascagoula and opening the outer bar.

Those improvements were accomplished by use of dredge boats, snagboats, towboats and barges. Those were constantly being repaired, improved, and updated in keeping with technological progress as America entered the industrial age. In 1912 the snagboat *R. C. McCalla* worked the Warrior River from Tuscaloosa to Demopolis, removing snags and other obstructions and doing some bank work. The bank work largely consisted of removing overhanging trees or trees which were destined to fall in the river. The dredge *Charles Humphreys* worked the same section of the river improving the channel. The towboat, *Nugent*, was employed in delivering stone and other materials to the locks and dams. New equipment was being purchased and old equipment was being repaired. A new derrickboat, *Tallahatta*, was completed and was ready for service. A new motor launch, the *Mulberry*, was purchased and delivered. The towboat, *Sylph*, and ten work barges were thoroughly overhauled. While the Tombigbee-Warrior River system was being improved more thoroughly than any other in the Mobile District, the above use of dredges and snagboats indicates the great activity in river improvement. The dredge, *Pascagoula*, was employed in lower Pascagoula River and in improving the bar at the mouth of the river. The non-propelled snagboat, *Escatawpa*, worked the upper Pascagoula and the Leaf and Chickasawhay rivers. This type of snagboat was slow and awkward since it had to be towed into each new position, but was rather effective in the shallow waters where it was employed. It worked Leaf River from the mouth of Bowie Creek just above Hattiesburg, Mississippi, to its junction with the Chickasawhay where they form the Pascagoula. A 3.5 foot channel was maintained at high water. There was considerable traffic from Hattiesburg even with that depth. During the calendar year, 1911, commerce on Leaf River was 167,120 short tons consisting largely of logs and timber. Value of the cargo was \$691,000.

This represented a decline from earlier years; when many hides, turpentine, and other products were shipped from Hattiesburg.

The self-propelled snagboat *Tombigbee*, was working Mobile river. It was a larger snagboat, which was placed into service in 1909. It worked above Three-Mile Creek while the snagboat *Demopolis*, removed sunken objects from the river below Three-Mile Creek and from the channel in Mobile Bay. The dredgeboats *Wahalak*, *Pascagoula*, and *Charleston*, were all working the channel in Mobile Bay and the outer bar. The United States dredge *Charleston* had been borrowed from the Charleston, South Carolina, District and the *Pascagoula* was transferred from Pascagoula. The dredge *Barnard* was working the Gulfport Harbor and Ship Island Pass. The snagboats *Pearl* and *Black Warrior* were improving Pearl River.

Those boats were owned by the Mobile District and were operated by hired labor. The Mobile District was depending more on its own resources and less on contracts by the opening of the twentieth century. It was accumulating a vast amount of equipment and staffing a corps of well-trained employees to accomplish the work. Snagboat operators, for instance, were becoming expert in detecting sunken objects in river channels even when in 10 to 20 feet of water. To the untrained eye the rolling waters of the river would say nothing, but to the snagboat crew the ripples indicated objects far below the surface.

Channel maintenance had become routine and continuous. Other types of projects were initiated due to special circumstances. This was especially true of the removal of sunken vessels. They were removed frequently, but time and place could not be anticipated. A good example was the removal of the steamer *Vienna*. The boat was reported sunk to the Mobile District office in October 1912. It went down at the Ten Mile Shoal in the Tombigbee River about 18 miles below Columbus, Mississippi. This was a wooden packet 155 feet long and 26 feet wide. It drew three feet of water. Net weight was 176 tons. Removal was authorized by the Chief of Engineers in November, and \$1,500 was appropriated for the project.

The work was accomplished by the Mobile District owned snagboat also named *Vienna*. The wreck was broken up by use of dynamite and the larger portions of the debris were placed ashore. The channel hazard was removed at an expenditure of only \$939.32. No property was recovered from the wreck as was sometimes true.¹⁷ The machinery was often recovered and installed in other boats. Certain types of cargo, especially steel, were also salvaged. This type operation was repeated many times in the Mobile District.

Another project, initiated between 1865 and 1917, was the removal of water hyacinths from canals, bayous, lakes and other bodies of water. The water hyacinth is a floating plant which infests waters of the Gulf Coast. It increases rapidly, and is killed back to water level by frost in the winter. Thick mats of those plants form what appears to be rich green floating islands in slow moving or still fresh water. Some lakes were completely covered and were ruined as far as fishing and navigation were concerned. Boats were sometimes caught in a sea of the plants which floated around them during the night or when unattended. Channels were often completely obstructed. The plant made its appearance in Louisiana about 1884, having been brought from the Orient as an ornamental flower. It appeared in Florida waters about 1890 and spread across the Gulf until it reached from Florida to Texas.

The first appropriation for hyacinth control was made in 1899. It called for the removal of the plants, the building of boats to accomplish the task and the construction of log booms to prevent spreading from one waterway to another. The project was not too successful. An act of 1902 authorized the use of "mechanical, chemical, or other means whatsoever" to clear the waterways. Those acts applied only to Louisiana and Florida. It was expanded to include Texas in 1905, but was modified to exclude use of any chemical process which might be injurious to cattle. The appropriation was extended to include Mississippi in 1912 and Alabama in 1916. Water hyacinths were not the problem in the Mobile District that they were for the New Orleans and Jacksonville Districts, but did require annual attention.

Another responsibility acquired by the Corps of Engineers during this period following the Civil War was the approval of bridge construction. Section 9 of the river and harbor act of 1899 required that plans for dams, dikes, or causeways be approved by the Chief of Engineers and the Secretary of War before construction commenced. Section 10 of the same act included construction of bridges or any other private structure or work which might obstruct or create hazardous conditions on any navigable waterway. For the remainder of the period before World War I, the Mobile District had to survey plans for all highway and railroad bridges and specify conditions under which they could be constructed, such as draw openings or height. Those projects approved on the District level were sent through the Division to the Chief of Engineers and then to the Secretary of War. He in turn presented them to Congress for legislative approval. This was never a major responsibility for the Mobile District, most of the work being routine. The Secretary of War did not always approve those projects submitted, however. Nearly 160 bridges were submitted nationwide in 1917 and he disapproved 18 of them.

It was during the period 1865-1917 that the organizational structure and boundaries of the Mobile District became fairly constant. The records are not clear, but evidence indicates that the offices of the District were on the second floor of a building at the southeast corner of Commerce at Dauphin Street when the District was revived in 1870. In 1890 it moved to the northwest corner of Dauphin Street at Royal. Again, the office was upstairs. The next site was 150 St. Francis Street. The office had moved to rooms 30-36, Young Men's Christian Association Building, by 1905. In 1918 it was at 352 Government Street in the Lowenstein House.

Civil projects were interrupted briefly in 1917 because of the war emergency. They were to be revived after the war and in the American climate of isolationism, the Corps would be primarily concerned with civil projects between World War I and World War II.

CHAPTER VII:

MILITARY PROJECTS FROM THE CIVIL WAR TO WORLD WAR I

During the Civil War the Mobile District was within the Confederacy. All work of the Corps of Engineers was suspended except as accomplished by engineer officers attached to the Union Armies. Engineer officers were present during the Battle of Mobile Bay in 1864. General M. D. McAlester was the officer in charge in the Alabama, Mississippi, Louisiana area. He brought a Lieutenant Burnham and a Lieutenant Allan, Corps officers, to Mobile Point to participate in the siege of Fort Gaines and Fort Morgan. Fort Gaines surrendered on 8 August 1864 and the next day all materiel seized was transferred to Pilot Town, passing within two miles of Fort Morgan. Lieutenants Burnham and Allan then directed the placement of guns and men, utilizing trenches left intact by the Confederates.

Work was initiated at once to repair Fort Gaines, which was found in excellent condition. It had been completed by the Confederates fully to the plans and specifications of the Corps of Engineers. It had been garrisoned by 818 officers and men; four 10-inch Columbiads; two 7 inch Brooks rifles; twelve or fifteen smooth-bores, some 24 inches and others 32 inches bore; and five or six flank casemate Howitzers. All the above was surrendered along with an abundant supply of ammunition and rations for two months.¹ Fort Gaines had proven weak and ineffective against both land and naval attacks, and surrendered when placed in a crossfire between land forces on the west and Farragut's fleet on the east. Fort Morgan was not in such a good state of repair. It had been caught in a crossfire between Rear Admiral D. G. Farragut's fleet in the Bay and Major General Gordon Granger's land forces. Shelling had continued at about thirty minute intervals during the daylight hours of 11, 12, 13 August 1864. The Chickasaw and the Winnebago from Farragut's fleet were shelling with 11-inch guns and 100 pounder Parrotts. The Manhattan was shelling with 15-inch guns. The vessels were at a range of 1,800 to 2,000 yards from Fort Morgan. On 14 August the land guns were ready to begin shelling and firing was commenced at 6 o'clock p.m.

The next day shelling began in earnest. Additional guns were ready to enter the shelling 16 August. During the day McAlester returned from New Orleans with Captain J.W. Palrey, who was placed in charge of engineering operations. McAlester had thorough knowledge of Fort Morgan and knew that it was not bomb-proof in certain areas. Shelling was directed on the basis of that knowledge.

The fort was shelled all night 16 August. Shelling continued until a storm on 19 August rendered work almost impossible in the latter part of the night. Little work was accomplished on 20 August because of stormy weather, but by 21 August two parallel trenches had been completed under the direction of Palrey. He was then ready to begin the Vauban type of zigzag trench to the fort. In the meantime the fleet had moved into close range and was increasing its shelling. About 9 o'clock p.m. 22 August, fire broke out in the fort and continued to burn all night. Between the fire within and the shelling without, the white flag of surrender was raised about 7 o'clock p.m. 23 August. By this time the fort was a shambles.²

No time was lost in rebuilding Fort Morgan. Mobile remained in Confederate hands, and was destined to do so until the battles of Spanish Fort and Blakeley. The two battles ended 9 April 1865 and Mobile was occupied by Union troops. Fort Morgan was held by Union forces for some seven months before the fall of Mobile. It was important, therefore, to rebuild and rearm the fort at once.

C. M. Fogg, superintendent of the construction and repair, left New Orleans on the steamer *Warrior* 5 October 1864 and arrived at Fort Morgan 9 October. He brought with him seven carpenters, three masons, and nine laborers. The *Warrior* had picked up lumber and kitchen utensils for the Fort. Captain D. W. Hall, assistant engineer, arrived 8 October with additional manpower on the steamer *St. Mary*. He brought cement and a box of hatchets.³

For the next several months steamers arrived frequently from New Orleans bringing

men and supplies. During December 1864 and January 1865 several steamers arrived each month. Old bricks were being cleaned, masons were busy laying bricks and other repairs were being accomplished by carpenters and laborers.

Word was received 19 April that the war was over. One hundred guns were fired at Fort Morgan in honor of the Union victory. Just two days later a gun salute of a different nature was staged. Though President Abraham Lincoln had been shot 14 April and died early the next morning, news did not reach Fort Morgan until 21 April. The flag was set at half mast and guns were fired on the hour throughout the daylight hours. All work except that which was considered absolutely necessary was suspended for the day.

The end of hostilities had no significant effect upon efforts to restore the fort although the urgency no longer existed. Masonry work was completely suspended for lack of materials in August. Laborers were engaged in pounding old bricks to use in making concrete in the absence of gravel. The work progressively slowed down until it became almost static. The actual structure was restored during the next three years, but it was becoming increasingly evident that radical modification, not restoration, was what was needed. The old Vauban type of walled structure had lost its usefulness as a defensive installation.

By 1868 the Corps of Engineers had returned to its normal organizational structure. No longer were engineers required to accompany armies, so they could return to peacetime projects. Things were not to be the same as pre-war Corps functions, however. The Civil War had brought about great changes in the economy as well as in the method of warfare. Out of the war modern America had emerged. The war produced the first great industrialists and foundations had been laid for the fortunes which were to be accumulated in the ensuing decades. The nation had become preoccupied with profit making and the energies of the country were drained off into areas of great industrial activities. The post war period saw the rise of such outstanding figures as John D. Rockefeller and his Standard Oil Company; Andrew Carnegie and United States Steel; J. P. Morgan in the

world of finance. The military projects suffered almost total neglect for nearly three decades, and it took the Spanish-American War to shock the American public into action.

A small appropriation was made in 1883 to protect Fort Morgan from erosion damage. A heavy gale in February had deepened the shoreline along the old sea wall and it threatened to collapse along its entire length. A brush and rock apron was laid in front of the wall.⁴ This expenditure was made to protect the site rather than Fort Morgan. The Fort was considered as having little military value without radical modifications, but the site was invaluable. Mobile Point, the site of Fort Morgan, was just east of the main ship channel in Mobile Bay. This channel was in easy reach of guns mounted on the point, making the site the most important in defending Mobile and, indirectly, in protecting the navy yard at Pensacola and the port of New Orleans from attacks by land forces.

As the Corps of Engineers became more insistent in requests for appropriations for defense construction, Congress developed arguments against such expenditures. The Chief Engineer charged as "reckless" the assertion that the underlying motive of the recommendation for the construction of forts and batteries was to overawe the cities in the vicinity of the projects and to use the need for such defenses as a pretext to enlarge the standing army to destroy the liberties of the citizens. It was pointed out that the forts as they were envisioned at that time had almost no defenses on the land side, so that militia from the cities could easily hold them until the Regular Army could be dispatched to any given site and take over the defense.

Such forts would require comparatively few soldiers in peace time, and would, therefore, require an increase of only a small fraction of the current force. In time of war the United States military system required that the garrisons of those forts be composed almost entirely of citizen soldiers. Not only that, but the forts would be placed as far away from the cities as the defensive requirements of the area would permit. The Corps also noted that the sea coast forts did not sur-

round the cities such as the fortifications surrounding Paris. Alarmists were pointing to Paris as a warning against creating a situation which would lend itself to a military takeover. Corps plans called for the construction of sea coast batteries removed from the cities and designed to protect narrow channels leading to the cities such as the channel in Mobile Bay. It was obvious that such structures could have no effect in overawing the cities, increasing the standing army, or impairing the liberties of the citizens.⁵ It took an international crisis and the Spanish-American war to awaken Congress to the necessity for action.

During the 1890's Cuba was in a state of rebellion against the rule of Spain. As the revolt gained in intensity, it became increasingly evident that the United States might become involved. If this happened, the Gulf of Mexico and Caribbean would be the site of much of the military activity. The Gulf Coast defenses suddenly took on great significance. The coasts of the United States were, for all practical purposes, undefended. Fortifications which did exist were obsolete and the ordnance mounted in the old structures was entirely incapable of deterring ships protected by armor plate and armed with powerful breech-loading rifles as had been uniformly adopted by all major naval powers. In 1886 the United States had no designs for modern guns in the blueprint stage and had no facility for manufacturing them. The first step in this recovery was the appointment by the President in 1886 of a Board on Fortifications and Other Defenses. This board was destined to investigate and make recommendations which Congress would heed.⁶

The first fortification act designed to carry out the recommendations of the Board for Fortifications, or Endicott Board, as the group was called, was approved 22 September 1888. This act created the Board of Ordnance and Fortification and made appropriations for commencing the manufacture of modern seacoast ordnance, but did not include funds for the construction of any batteries. The first appropriation for construction of gun and mortar batteries was contained in an act of 18 August 1890. Each year thereafter appropriations for varying amounts were made for manufacturing of ordnance, construction of

batteries and torpedo defenses.

Plans were carefully detailed for each locality and submitted to the Secretary of War for approval before work was actually begun. By 1900 the number of localities for which permanent seacoast defenses had been adopted had been expanded from the original twenty-seven to thirty.⁷

Pensacola Bay, under Major Frederick A. Mahon, Montgomery District Engineer, had the most elaborate defense system along the Gulf Coast. No attempt was made, however, to rebuild old Fort McRee which had fallen victim to tides and storms. Two outlying batteries were constructed instead. They were Battery Slimmer with two 8-inch guns and Battery Center with four 3-inch guns. These were situated to protect the ship channel into the navy yard and Pensacola Harbor. The channel was in the process of being deepened to accommodate the new larger ships of the navy.

No batteries were constructed in the vicinity of Forts Barrancas and Redoubt, though the forts were to be occupied by troops in both World War I and World War II. Santa Rosa Island was the site most heavily protected. During the 1890's eight batteries were built. This constituted the total built on that island except for Battery Langdon first built in 1917 and rebuilt in 1942.

A railroad was constructed from a recently built 100-foot wharf to serve the batteries. It was extended to the south beach from which clean sand was secured for the concrete used in constructing the batteries. Many minor repairs and modifications were also accomplished to make the Pensacola Bay defense system modern so as to meet the requirements of the time. Artillery troops were stationed in the area during the Spanish-American War and for some years thereafter.

In 1912 the Artillery District of Pensacola was assigned to one battle command divided into three fire commands and one mine command. The battle commanders were stationed at Fort Pickens in or near the old fort. The first fire command was located at Fort Pickens and consisted of Battery Worth. The second was also located at Fort Pickens and consisted of Batteries Pensacola, Cullum

and Cooper. The third was at Fort McRee and consisted of Batteries Slimmer and Center. The mine command was located at Fort Pickens and consisted of Batteries Van Swearingen, Payne and Truman.⁸

During much of the period between the Spanish-American War and World War I, Lieutenant, later Captain, J. E. Turtle was resident engineer at Pensacola with offices at Fort Barrancas. He spent most of his time in routine maintenance. Two major problems confronted him; one updating the lighting facilities, especially searchlights. The other was protecting the Fort Pickens area from erosion. Currents constantly eroded the west end of Santa Rosa Island until the fortification foundations were endangered. A seawall was built to protect Fort Pickens in 1910, and the process was reversed. Rather than eroding, now the western end of the island tended to build up so that during the next sixty years the shoreline was extended nearly a mile.

Plans for the defense of Mobile Bay were slower in materializing. The plans were a part of a defense system recommended by the Endicott Board. The system was outlined in the Board's report dated 16 January 1886, indicating the localities where defenses were urgently needed, the character and general extent of defenses and estimated costs. A list of twenty-seven principal ports where defenses were most urgently needed was arranged in order of their importance with Mobile listed as number fourteen. The Mobile District was under the direction of Major William T. Rossell, assisted by Lieutenant James Cavanaugh.

Plans called for construction of five batteries of various sizes at Fort Morgan. They were ultimately constructed and named. The first, Battery Bowyer, was named for Colonel John Bowyer, who was stationed at Mobile Point in 1813, and commanded the fort there which bore his name.⁹ By 1899 the work was complete and turned over to the artillery garrison.

The next work was Battery Duportail, named for Major General L. L. Duportail, who was Chief Engineer from 1777 to 1783. This battery was armed with two 12-inch breech-

loading rifles mounted on disappearing carriages. For these guns, a battery of massive concrete construction was placed all the way across old Fort Morgan. It divided the fort almost in half, but was placed slightly to the back. Upon completion of the battery, the entire back of the old fort was filled with sand which was designed to cushion the shock of the firing of the guns and afford additional protection for them.

A battery designed for two 4.7-inch Armstrong rapid fire guns mounted on pedestals was provided for in an appropriation 9 March 1898. This battery, later named Battery Thomas, was of simple construction.

Battery Dearborn, named for Major General Henry Dearborn of the War of 1812 fame, was armed with eight 12-inch breech-loading steel mortars. Construction was initiated in 1899. It, like Battery Duportail, was a massive structure and situated some distance from the other batteries on the east. The guns were placed so as to traverse a broad segment of the Gulf to the south.

The last of the system was Battery Schenk, which was armed with three 3-inch guns. The records concerning this battery are not clear, but it is listed in an inventory discussed by a board of officers meeting at Fort Morgan in July 1917 to review the state of preparedness in the southeast.¹⁰ The battery was named after Brigadier General Robert C. Schenk, who served with distinction during the Civil War. The 1917 inventory also noted an experimental emplacement for a 10-inch gun on a disappearing carriage, although no name was ascribed to it.

Since there was so much construction under way due to American involvement in war, many new buildings were built to facilitate the work during 1898. One barrack for laborers, 150 feet by 18 feet, was constructed. Other construction included a tool and store room 50 feet by 20 feet, and an extension to the cement house 80 feet by 46 feet. The existing wharf proved too small and inadequate to accommodate 12-inch guns and carriages so a new creosote pile wharf 625 feet long, reaching to the edge of the deep water channel, was constructed. Materials were purchased on the open market and the work was done under oral agreement.

Due to war time conditions, the military requirements were given priority. Badly needed machinery, lumber and other materials were purchased on the open market and installation of the guns was expedited. Arrangements were made for the purchase of gravel, stone, cement, steel work, and framing lumber for concrete. To supply the immediate needs, 2,991 barrels of cement purchased for the improvement of the Tombigbee River, Alabama, was transferred from McGrews Shoals, where it was in storage, to Mobile Point.¹¹

During the fiscal year 1897-1898, with funds allotted by endorsement of the Chief of Engineers dated 15 June 1897, three casemates of Fort Morgan were cleaned and repaired for the storage of torpedo material. One casemate for the smaller and more delicate apparatus was sealed throughout and fitted with cases and shelves. The casemates were cleaned, whitewashed, and fitted with skids for the storage of torpedo cases and anchors. Torpedo materials were supplied by the Engineer Depot at Willets Point, New York, and buoyant mines were transferred from Charleston, South Carolina.

The Chief of Engineers set aside \$1,000 from the appropriation act 9 March 1898 for the torpedo defense of Mobile. With those funds and the assistance of a detachment of engineer soldiers, consisting of one sergeant and six privates, the entrance to Mobile Bay was mined as far as available materials permitted. Dynamite was purchased, cables and junction boxes put into position and the mines loaded and planted in place. A searchlight with a 30-inch projector, complete with a generating plant, was received from the Engineer Depot at Willets Point, New York.

For firing mines a base line was selected, and stations were prepared at each end and connected with the torpedo casements by telephone. One station consisted of a small house sunk in the sand completely concealed except for an opening toward the mine field. From those two stations any vessel crossing the line of mines could be detected and the information called to the casemate. Three electricians were employed to care for and operate the mines. One of them was kept on duty at the mining casemate at all times.

Fort Gaines did not receive much consideration during the 1890's. The Endicott Board was slow in formulating plans for that site, and when completed, they were not as elaborate as those for Mobile Point. Completed plans approved by the Chief of Engineers in 1901 called for two batteries in old Fort Gaines armed with two 6-inch guns. Those were mounted in front of and over the casemates of the northeast and southeast sides of the fort. The casemates were sealed off and were filled completely with sand. There were two magazines constructed of concrete. Those batteries were constructed but appear to never have been equipped according to plans. Also completed was a small battery to the north of the fort designed for one 15-inch Parrott.

There were two projected emplacements approved by the Chief of Engineers in 1901 which were never constructed. One was located west of Fort Gaines situated somewhat inland from the shoreline 300 yards from the eastern tip of Dauphin Island. It was designed for one 15-inch rapid firing Parrott. The other was immediately south of that location and was designed for one 6-inch rapid firing gun.

Necessary support buildings were included in the plans such as barracks, officers' quarters, non-commissioned officers' quarters, mess halls, a bakery, and a hospital. Only two of six buildings were constructed for officers' quarters. One of two barracks, one mess hall and one non-commissioned officers' quarters were constructed.¹²

By 1902, the United States had begun to forget the Spanish-American War, and there appeared no other serious threat to the nation's security, consequently there was a decline in interest in military preparedness. Following the Spanish-American War the United States repeated the errors of the post-Civil War era. When war was declared in 1917, the nation was utterly lacking in readiness for a great military and industrial effort. Understanding the complete lack of American preparedness and inability to retaliate, Germany launched unrestricted submarine warfare in 1917, believing that the allied powers could be defeated before the United States could come to their aid in any

significant strength. Unpreparedness cost the Americans a fearful price. The inability of the United States to throw a powerful army into the conflict without delay prolonged the war and increased the danger of a German victory. The United States learned little from the Spanish-American War. The same lack of preparedness was present in the 1939-1940 crisis.

There were some projects under the general direction of the Mobile District or projects of great interest to the Corps which were not of a military nature connected with the forts. In 1879 a request was submitted to Secretary of War, Alexander Ramsey, for permission to use the Fort Morgan Reservation for a telephone station. The request was made by Charles A. Holt, who proposed to run a line up the eastern shore, hence to Mobile. Justifications cited for such a project included communications available in time of war, convenience for the War Department and use available to the lighthouse, the Signal Corps, and the Corps of Engineers.

Conditions under which the Chief of Engineers endorsed the project were stated in a communication 8 January 1880. Holt must agree to vacate the public lands, including the telephone lines, at any time the public interest demanded it. He must erect no buildings on or near the reservation without first obtaining permission in writing from the Secretary of War. It was further stipulated that any department of the government, by its officers, should have use of the telephone for public purposes without charge or expense to the United States, its officers, or agents. Holt concurred, and Captain Dammell, Mobile District Engineer, relayed the information to the Secretary of War.

The project developed slowly, however, and the company to furnish the telephone services was not incorporated until 19 May 1888, in the Probate Court of Mobile County. Designated the Mobile and Gulf Telephone Company, the firm listed Charles A. Holt and Warren A. Anderson as officials. William C. Endicott, Secretary of War, gave permission for the company to occupy two rooms at Fort Morgan as an office and sleeping room.¹³ Holt then rejected the conditions of the Secretary of War and proposed to establish the

station outside the reservation. There was no further reference to the project in the official records, as it ceased to concern the Corps of Engineers.¹⁴

A project of much more serious consideration was a quarantine station which was then maintained at Fort Morgan. In 1879 there were two quarantine stations in the Gulf of Mexico. One was located at Dry Tortugas off the tip of Florida, and the other at the east end at Chandeleur Island just east and slightly north of the mouth of the Mississippi River. Both stations were remote from normal trade lanes used by vessels maintaining trade with Mobile. Curiously, Havana, Vera Cruz and a number of other ports were not required to send their ships by the quarantine stations, but were permitted to enter Mobile Harbor directly.

A quarantine station was established at Fort Morgan at the request of Dr. T. S. Scales, Health Officer, Port of Mobile. Negotiations were opened by correspondence sent to the Secretary of War through the National Board of Health 12 August 1879. Scales urged that the Secretary of War authorize the erection of hospital buildings on the Fort Morgan reservation in accordance with plans and specifications approved by the National Board of Health. The Secretary of War authorized the Mobile Board of Health to proceed.¹⁵ The entire project was based on an Act of Congress 3 March 1879 which authorized the organization of a National Board of Health. The act was expanded 2 June 1879 to authorize cooperation with state and city boards of health.

For the next decade a station was maintained at Fort Morgan in the early summer and all infected seamen were detained there. The City of Mobile proclaimed a quarantine against all ports known or suspected of being infected with yellow fever. Every vessel entering the port was required to anchor at a designated point in lower Mobile Bay, where it was boarded by a quarantine physician. If it was not from a quarantined port, it was then inspected and given a clean bill of health if no infection was discovered, and permitted to proceed to Mobile. If the ship was from a quarantined port, it was required to remain at anchor for a fixed number of

days and if no infection developed during that time, it was permitted to enter the port.

Many ships were sent to Ship Island, later to Chandeleur Island, to quarantine stations there because of infections. Mobile was saved from yellow fever infections several times by this practice. In 1890 the quarantine hospital, authorized in 1879, still had not been built, but two buildings on the Fort Morgan Reservation had been used by the quarantine physicians, and sick seamen were sometimes detained there. During the year 1890 plans for the establishment of a real quarantine hospital progressed.

The project met opposition from two sources. The citizens of Baldwin County objected because of fear that epidemics might result from the detention of infected seamen at Mobile Point. They presented a petition to the Secretary of War voicing their opposition. The other source of opposition came from officials of the Birmingham, Mobile and Navy Cove Railroad Company. The company was organized under an act of the Alabama Legislature 28 February 1887.

The company requested permission to construct docks, warehouses, and tracks for a terminal on or near the Fort Morgan Reservation. The purpose of the company was to construct a railroad which would reach deep water. The project was promoted on the assumption that a deep channel accommodating ocean-going vessels would never be dredged to Mobile Harbor.

By an act of Congress 20 July 1888 the company was granted the privilege of using a fifty-foot strip along the northern high water line. It was stipulated that a future Congress could cancel the privilege or the Secretary of War could annul this concession at any time the public welfare might dictate.

In 1890, the Quarantine Board of Mobile requested permission to construct a 1600-foot pier into Mobile Bay to accommodate a proposed hospital and a quarantine plant which would include a means to thoroughly disinfect ships headed to Mobile. This Board was established by the Commercial Club of Mobile with Gayland B. Clark, President. It was dedicated to provide protection

of the citizens of Mobile from epidemics and also for fostering the promotion of trade. The current quarantine practice delayed ships and slowed trade. A new modern quarantine station would expedite matters and cut down delays.

Thaddeus McNulty, President of the Birmingham, Mobile and Navy Cove Harbor Railroad, objected to the proposed hospital and pier.¹⁶ McNulty based his objections on the grounds that the proposed pier and hospital would defeat the purpose of the railroad company to build a good deep harbor around which a city would develop. He envisioned a prosperous business community at Mobile Point which would become the major port of the Gulf of Mexico. McNulty further argued that to permit the construction of the pier was in violation of the spirit by which the government had granted the railroad right-of-way.

R. H. Clark and H. A. Herbert insisted that the Quarantine Board already owned the property where the proposed hospital was to be constructed. McNulty learned that this was not so. The Quarantine Board had just opened condemnation proceedings to secure title to the land in question, adjoining the Fort Morgan Military Reservation which had been set aside by the Secretary of War at the request of the Chief of Engineers 10 September 1842. Since the land in question was outside the Reservation, it appeared that it should be settled by the Quarantine Board and the railroad company without the Federal Government becoming involved.

In the course of the dispute the use of facilities which had been made available to the Mobile Board of Health in 1879 was revoked. Mobile now had no adequate means of quarantine protection, and during the next few months both yellow fever and smallpox had infected Mobilians, having come to the city from vessels out of Cuba.

In defense of its project, officials of the railroad company submitted a prospectus to the Corps of Engineers. It was noted that ships took on only one-fourth of their load at Mobile and then traveled twenty-eight

miles to a point near Fort Morgan to complete the load at sea. The increased cost was some \$500 over what it would cost if loading could be accomplished at wharfs at Mobile Point. An estimated one-third of the cost and two thirds of the time would be saved if a railroad to deep water could be constructed. The company further noted that cotton exports from Mobile had dropped from 810,000 bales in 1860 to 45,000 in 1890. Reason for the decline was the improvement of the Mississippi River by the construction of the Eads' Jetties at the mouth of the river. Mobile, it was argued, should carry at least twenty-five per cent of all United States cotton exports.

In addition to cotton the oyster beds near Fort Morgan yielded 200,000 barrels of oysters annually without cultivation. Fish banks of the Gulf yielded pompano, red snapper, and mackerel. Tropical fruits should come to Mobile rather than New Orleans. Iron ore could be imported from Cuba to be processed with use of Alabama coal. Company officials saw Mobile Point peninsula as ideally situated to become a great trade center and resort city. It was noted that already large numbers visited the beaches by way of boats from Mobile.¹⁷

The railroad company could not get its project underway, and in 1897, ten years after the company was organized, W. P. Craighill, Chief of Engineers, recommended that the privilege to use the military reservation property be annulled. He pointed out that Mobile had been placed fourteenth in the nation in terms of defense importance. By this time the plans for modernizing the defenses of Mobile Point were being implemented and the space granted the railroad company was needed to carry out defense operations. Secretary of War Daniel S. Lamont, concurred. The railroad was not constructed, and the great dreams of a city on the peninsula never materialized.

A quarantine station was never constructed or operated on as large a scale as the Quarantine Board had hoped and projected. Upon the request of H. A. Herbert, District Engineer, and concurred in by the Chief Engineer, the former facilities were again made available to the Quarantine Board, and previous procedures were continued. To avoid further disputes concerning the property, however, an additional tract of 171.5 acres was added to the military reservation in 1906.¹⁸

CHAPTER VIII: THE INTRACOASTAL WATERWAY

The Mobile District of the Corps of Engineers was extremely active in civil projects between World War I and World War II, but the work was much less spectacular. No great fortifications were built and national defense projects were almost non-existent. The Mobile District was primarily engaged in river and harbor improvements. This was usually in the form of widening and deepening harbors and waterways, accomplished by floating dredges. The District engineers were referred to derisively by some as the "mud pumpers." The work of the Mobile District from the turn of the century to the opening of World War II has been called the "mud-pumping era."¹

The area comprising the present Mobile District was still divided between the Mobile and Montgomery Districts. District Engineers were transferred frequently; seven serving the Montgomery District between 1918 and its merger with the Mobile District in 1933. The civil boundaries of the Mobile District were established at the time of this merger. It then extended to the vicinity of Tallahassee, Florida, and included most of the western portion of Georgia; a limited area in southeastern Tennessee; all of Alabama except the Tennessee River Valley, and most of Mississippi. The boundaries conform basically to river systems. The military district boundaries were destined to change considerably during and after World War II.

While this was an era of less dramatic projects, certain significant accomplishments should be noted. This period saw the completion of the Mobile District section of the Intracoastal Waterway. The multi-purpose dams of the Mobile District were constructed after World War II, but projects were initiated before the war which foreshadowed the later accomplishments.

A less dramatic accomplishment of the District during the depression years was the employment of many engineers and sub-professionals. The Corps offered employment at a time when there was little demand for engineers in private industry and other areas. Many were attracted to the Mobile District and became career employees. Many persons

employed during the depression years were scheduled for retirement during the 1970's. They have proven invaluable to the Corps during its most active and demanding period, the World War II period and the space age.

The completion of the Intracoastal Waterway was the greatest project during the era between the great wars. The project affords a protected coastal water route along the Atlantic and Gulf of Mexico coasts of the United States. It has made it possible for commercial tows and other light-draft vessels to move safely along the coasts from Massachusetts to the Mexican border, except for a few gaps which remain to be improved. The project has been accomplished piecemeal and over a long period of time. That segment which falls within the Mobile District extends from Carrabelle, Florida, to Lake Borgne in Louisiana. The length of the improved route is 344 miles. The project was improved to provide a channel 9 feet deep and 100 feet wide, but it was enlarged during World War II to 12 feet deep and 125 feet wide, except from Mobile to New Orleans, where it was widened to 150 feet.

The first appropriation for the waterway in the Mobile District was made in 1828.² Though projects discussed below have been introduced in earlier chapters on civil projects, they are reviewed here. The concept of a continuous waterway constructed as a single project was never funded. Each segment has been justified and funded as need to connect certain points became pressing.

The Gulf of Mexico is subject to severe and sudden storms, creating real danger for small craft which venture into open waters. The early settlers used the many bays and sounds along the coast for protection. Water transportation was especially important since other modes of transportation were slow to develop because of the marshy nature of most of the coastal country. Lakes Borgne and Pontchartrain and Mississippi Sound afforded protection from New Orleans to Mobile except for Pass au

Heron at Mobile Bay. Ships which could navigate in the inland route to Pass au Heron were forced to go into the open Gulf at Dauphin Island increasing danger and, therefore, insurance rates.

Congress appropriated \$28,000 in 1828 for the improvement of Pass au Heron, but several years of effort were finally declared a failure and the project was abandoned. In 1839 Captain John Grant was given a monopoly on the pass. He improved the channel and began charging a toll. This did enable ships to avoid the increased risk of the open waters.

The Topographical Engineers made surveys in 1826³ with the view of connecting Mobile Bay and Pensacola Bay by canal, but the project was not funded. Captain William Chase surveyed all the channels and islands between Mobile and New Orleans in 1830. He charted the best route for navigation between the two points and marked sites for needful lighthouses and buoys. Another survey was made between Mobile Bay and Pensacola Bay in 1833, and still another in 1852. The latter expanded the survey across the Florida Peninsula with the hope of connecting the Gulf of Mexico and the Atlantic. Sectional strife precluded any such major project for the next few years and then the Civil War resulted in further delays.

Citizens of Savannah, Georgia, had hopes of securing a portion of the Mississippi River commerce for that port city.⁴ The mayor and the Savannah Chamber of Commerce urged in 1873 that the project for an intracoastal waterway connecting New Orleans and Savannah be reviewed. Captain A. N. Damrell, District Engineer, Mobile District,⁵ reacted to the surveys in a report dated 19 September 1873. Damrell suggested that a route through Mobile District was feasible from an engineering point. From the New Orleans District boundary in the west to Apalachicola in the east there were numerous bays and sounds which could be connected by canals.

He predicted, however, that such a project would be a financial failure. As long as the ports of New Orleans and Mobile remained open, he could see no need for an intra-

coastal waterway through the Mobile District unless it had a terminus at a good harbor on the Atlantic coast. Damrell's report appeared in the 1876 *Annual Report* of the Chief of Engineers along with one by Captain C. M. Howell, District Engineer, New Orleans District. Howell saw no advantage in opening a route which would terminate at Savannah. It was preposterous, he said, to think that Savannah could draw any portion of the commerce of the Mississippi River, either import or export, over such a waterway. As long as the Port of New Orleans remained open, he saw no commercial value in a waterway which crossed the Florida Peninsula.

If, on the other hand, in time of war a hostile fleet blocked the Gulf of Mexico ports, an inland water route would be invaluable. He could justify the project, then, on military, but not on commercial grounds.⁶

The next appropriation of the Mobile District was authorized in 1910, when two segments were approved. The River and Harbor Act of 25 June 1910 authorized a five-foot channel at mean low tide 65 feet wide from the Apalachicola River to St. Andrew Bay. It further authorized a 6-foot channel with no reference to width from Choctawhatchee Bay to Pensacola Bay. From this beginning the waterway was accomplished all the way across the Mobile District.

When the channel from Apalachicola River to St. Andrew Bay was initiated by a survey accomplished in 1909 and authorized in 1910, little change had taken place since Lieutenant W. G. Williams surveyed the area in 1833.⁷ After considerable discussion it was decided that Apalachicola River would be connected with Panama City on St. Andrew Bay. Port St. Joe, a good natural harbor, was another possibility, but marshes reached far into the interior above Port St. Joe, and it would be more difficult to establish rail connections with that port. Panama City had relative high ground toward the interior, making it more accessible. It was determined that that port was a more practical terminus for the project.⁸

The swampy terrain through which the survey party worked was infested with bears, panthers, alligators and poisonous reptiles. Rubber boots, snake bite kits, and

side arms were an essential part of each man's equipment.⁹

Work on the channel began in 1911 and was completed to the required dimensions in 1915. Cost of the project was \$505,000. Though this channel was only five feet deep and 65 feet wide, it was later enlarged to nine feet in depth and 100 feet wide.

During the Civil War, Grant's Pass fell into disrepair and vessels navigating Mississippi Sound were forced to take the longer, more dangerous open water route at increased insurance rates. A project was authorized in 1913 to improve the pass, accomplishing a 10-foot by 100-foot channel. The work was completed in 1914. The channel was increased to a 300-foot width in 1930.¹⁰

One after another of the segments were approved until the entire project was completed. The section from Mobile Bay to Pensacola Bay was completed in 1936. That from Choctawhatchee Bay to West Bay, Florida, was finished in 1938. Most of the work was routine and was accomplished by use of floating dredges. The latter mentioned channel did present some unique problems. The channel started at the 10-foot contour in West Bay, where the ground elevation gradually increased to zero at a point about seven miles west, where the new channel left West Bay Creek. There was a rapid increase from that point until an elevation of approximately 40 feet above mean low tide was reached about 15 miles west of the West Bay starting point. It continued at that elevation for about four miles and then gradually decreased to zero at Tucker Bayou. The 10-foot depth was reached about three miles out in Choctawhatchee Bay. This means that for approximately four miles the banks of the channel would be about 50 feet from the 40-foot elevation to the bottom of the 10-foot channel. The soil was almost pure sand. The cut was made with hydraulic pipeline dredges working under contract between the Corps and Sternberg Dredging Company of St. Louis and the Shell Producers Company of Tampa, Florida. Sternberg's dredge *Duplex* worked westward from West Bay and Shell Producer's dredges, *Punta Gorda* and *Tennessee* worked east-

ward from Choctawhatchee Bay. As they moved into the higher elevations, the sand did not slope off uniformly. It frequently stood in an almost vertical position and then suddenly caved in. The ladder and forward part of the hull of the dredges stood in danger of being covered by the sand, resulting in loss of much time.

A simple solution to the problem was found. When the dredges had advanced into the land cut, a dam of earth was constructed across the channel. All the water discharged by the dredges together with seepage and water from natural drains created a reservoir which raised the dredges to an elevation where the danger from caving sand was of no serious threat to the machinery. This also made shore connections much easier and prevented much of the bank erosion from discharged water rushing back into the channel. When needed, additional water was pumped into the pools from the channel behind the dams.¹¹

The original cut was made by Shell Producers Company's small dredge followed by a larger dredge, providing a greater depth. The water level was then lowered and a second cut made by each dredge. Finally the dams were removed and the water was permitted to find its natural level. Then both contractors made their final clean-up cut.¹²

Another problem developed as a result of the elevation and the sandy nature of the soil. Several natural drains had been crossed, and they now discharged into the newly cut channel. The flowline elevations of those drains were much higher than the water level of the channel and rapid erosion of the canal banks began at once. The channel was opened in April 1938, and it was evident at once that some system of protection had to be devised to prevent the excessive shoaling at the mouth of the drains. Levees were built between the structures to protect the banks. After considerable difficulty, the erosion ceased, and it appeared that the erosion control protective system was effective.

In 1944, however, it was noted that the inlet pipe had worn through in numerous places and at mile 263 the south bank fail-



NEW WORK DREDGING IN CHOCTAWHATCHEE BAY TO WEST BAY SECTION
OF GULF INTRACOASTAL WATERWAY, DECEMBER 1937

ed and materials from the dam partially blocked the canal. Repairs had been almost completed on 10 September 1944, but between 7:00 a.m. and 7:00 a.m. the next day, about seven and one-half inches of rain fell in the area. The soil was already saturated from previous showers, and could absorb little of this rain. As a result of the excessive run-off, three of the control structures were destroyed and the levee broke in two places. The channel was completely blocked to traffic. The Texas Oil Company tug *Houma* was trapped in the shoal. Sand washed in around the tug and on 11 September the boat was 30 feet from the nearest water. The tug was equipped with a two-way radio telephone and soon made its plight known. The dredges *Wahalak* and *Pascagoula* and the draglines No. 1 and No. 2 were dispatched to clear the channel, this being especially urgent because of the war-time demands for the movement of petroleum. On 24 September the channel was restored. The tug *Houma* had been trapped in an upright position, so there was no damage to boat or crew. A more adequate erosion control system was designed and completed in 1946, thus removing danger of any future damage even during excessive rainfall.¹³

By the opening of World War II the waterway was complete along the 344-mile Mobile District section. The channel was increased to 12 by 125 feet to accommodate increased demand of war-time traffic. Though the terminus was at Carrabelle, Florida, a remote, relatively insignificant port, the Intracoastal Waterway was extremely important. Because of a petroleum shortage in the East, pipelines were laid by the Government from Carrabelle to Jacksonville, Florida, and Chattanooga, Tennessee. Because of the operation of German submarines in the Gulf of Mexico, it was determined to transport gasoline and other petroleum products by barge and pipelines to prevent the dangers of the open sea lanes experienced by the oil tankers.¹⁴ Barges delivered the petroleum to Carrabelle and it was piped to the other distribution centers.

The increased dimensions were begun in December 1942 and were completed in 1943

at a cost of \$2,957,975. It was accomplished by private dredging companies under contract and by Corps dredges. This expenditure brought the cost of the 344-mile waterway to \$5,880,467.

The commercial use of the facility greatly exceeded the forecasts used in the survey reports to justify the project. The Mobile District section connected with the New Orleans District at Lake Borgne in Louisiana and constituted a segment of a waterway which now extended from Carrabelle, Florida, to Brownsville, Texas. The last link of this system approved was the Mobile Bay to Pensacola Bay segment. It was justified on the basis that the facility would carry 197,000 tons of traffic annually. During the war the peak annual traffic exceeded 4,000,000 tons.¹⁵ Cargo has included petroleum products, iron and steel, coal, sulphur, and in more recent years, much pulpwood. Many other items in lesser quantities have also been transported by way of the facility.

In addition to transportation of cargo, the waterway is an ideal route for pleasure craft, affording protection from the turbulent waters of the open Gulf throughout the greater portion of its length. It also traverses one of the most scenic sections of the country, including many bays, bayous and lagoons which abound in numerous species of game fish. Added to those facts is the year round mild climate which makes it one of the favorite routes for fishermen and yachtsmen.

While the Intracoastal Waterway was receiving primary attention, the Mobile District was busy improving and maintaining river and harbour channels. Beginning with the St. Marks River, Florida, the rivers and harbours across the district to Pearl River in the west were kept open through dredging and snagging. The Alabama and Coosa Rivers in Alabama and Georgia were improved by a system of locks and dams and opened to navigation to Rome, Georgia. By the opening of World War II, the improvements were simply being secured with no projected future improvements. By 1930, railroads,

trucks and bridges had just about ended river transportation except for barges on the more important rivers. In 1939, there were only two small privately owned terminal facilities in Rome, and none in Gadsden, Alabama. Use of the channel of the Coosa River did not justify further expenditures for the time being.¹⁶

The Black Warrior, Warrior and Tombigbee Rivers were very much in use and projects were initiated to update those facilities. One project was the Sunflower Bend cut-off. A cut of 1.4 miles would cut several miles distance from the previous route. It was further projected to raise dam 17 an additional 12 feet by constructing crest gates on the dam. A new lock and dam was projected to replace locks and dams numbers 10, 11 and 12. The new facility was to be constructed in the vicinity of Tuscaloosa. This was the beginning of a program which included a system of modern locks and dams for the entire system, but one which would be accomplished after World War II.¹⁷ This project foreshadowed the construction of the great multiple-purpose dams after the war. The entire concept of dam construction was revolutionized during the 1930's. Electric power and flood control became as important a consideration as navigation. With the passage of the Flood Control Act, 28 August 1937, amended in 1939 and in 1941¹⁸, rivers were surveyed and projected in their entirety. These two considerations, hydro-electric power and flood control, were destined to give a tremendous boost to the Corps' civil projects in the future, with recreational facilities an important secondary consideration.

The late 1930's saw the emergence of an organizational structure not unlike that of the Corps currently. In 1939 the Mobile District consisted of a River Division, a Harbor Division and an Engineering Division. There were administrative support units for personnel, finance, cost, procurement, reproduction and real estate. The Engineering Division was the most complex with Engineering, Reports, Design, Drafting, Survey and Discharge Sections. The Discharge Section was later changed to Flood Control. The Mobile District was within the Southeastern Division of the Corps.

The top ranking civilian engineer was a Principal Engineer at \$5,200 per year. Associate Engineers received \$3,200 per year. Engineering at the journeyman level was performed at \$2,600 and \$2,000 levels. While this appears low pay by later comparison, there was no widespread complaint at the time. The depression was subsiding and things looked brighter.¹⁹

The professional skills required of Corps engineers on the eve of World War II were those pertaining mainly to design of hydraulic structures. There was a lesser demand for mechanical and electrical engineers. A revolution was taking place in the concepts of dam construction, however, and many studies were underway on navigation, flood control and hydropower development projects. No one could anticipate the tremendous demands which were about to be thrust upon the Mobile District with the coming of the war. The era of "mud pumping" gave way dramatically and suddenly to an era of military projects, only to be overshadowed, in turn, by the demands of the aerospace age.²⁰

CHAPTER IX:

THE GREAT WAR: 1939-1945

Following World War I the American people thought the United States could avoid future involvement in wars with major powers. Congress and the Presidents reflected this sentiment for fifteen years following 1921. As a result only a minimum of defensive military strength was maintained. The United States was active in international diplomacy in seeking to promote international peace and limitations of armaments. National policies did not change significantly until the eve of World War II.

Under the leadership of Chief of Staff General George C. Marshall and Secretary of War, Henry L. Stimson, the Army embarked on a large expansion program in the summer of 1940. This program was designed to protect the Western Hemisphere against any hostile forces from the Old World. After the fall of France in June 1940, the American people gave full support to the preparedness program though still strongly opposed to entering the War. They were now convinced that the United States was in real danger, both from Germany and Japan. Between May and October 1940, Congress appropriated over \$8 billion¹ for the Army's succeeding year. This was more than the support given to all military services during the preceding twenty years. The munitions program called for procurement of equipment by October 1941 sufficient to maintain a 1,000,000 man force. This force was to include a greatly enlarged and modernized Army Air Corps.

On 27 August 1940, Congress approved the induction of the National Guard and the calling up of the Organized Reserves. This was followed by the historic peace-time Selective Service and Training Act of 14 September 1940. Units of the National Guard and Reserve Officers entered services as rapidly as the Army could provide housing for them. During the last six months of 1940, the active Army more than doubled in strength and by mid-1941 the planned strength of 1,500,000 officers and men had been achieved. A new organization, General

Headquarters, assumed command of the training program in July 1940. The Mobile District was deeply involved in the program by mid-1940.

New airfields, depots and training facilities were needed for the fast-growing Army Air Force. Because of climatic conditions which permitted year-round training and other favorable flying conditions, most of the training bases were located in the southern United States, with many being established within the boundaries of the Mobile District. Construction of those facilities was undertaken by the Army Quartermaster Corps.

Because of the magnitude of the responsibilities of the Quartermaster Corps, airfield construction was transferred to the Army Corps of Engineers in November 1940. In December 1941 responsibility for all military construction for the Army was transferred to the Corps.²

This new area of responsibility had an immediate effect on every aspect of the Mobile District. Previous responsibilities did not require many skills now necessary for the District to meet its new tasks. Among the new skills needed were architects, structural specialists, pavement specialists, heating and ventilating engineers, sanitation engineers, specification writers, and petroleum specialists. It was necessary to recruit those from private industry or from other governmental organizations. Many recruits for those responsibilities were those holding Army Reserve commissions who were simply called up for active duty and placed in positions of their specialty.³

Considerable reorganization was necessary. A new engineering unit, the Airfields (later military) Sub-Division was created. Other aspects of the District were re-oriented to meet a task of tremendous magnitude, foreign to District experience, to be accomplished in a brief time. All civil responsibilities were discontinued or subordinated to military requirements. Accom-

plishments were amazing, both in scope and in time required. Between December 1940 and 31 December 1943, the District completed military construction which had cost \$833,963,000.

In addition to this new responsibility, the District was given expanded coastal defense duties. Because the New Orleans District had developed only limited military construction capability, the Mobile District was given coastal defense projects from the mouth of the Mississippi River eastward to include the Gulf Coast to the St. Marks River. All military construction of the Vicksburg District and that in Tennessee was also assigned to the Mobile Office.⁴

In this age of air power, the traditional coastal defense system of forts and batteries had little place, but the Gulf of Mexico brought the European war close to American shores. The Port of New Orleans was second in the nation, and of tremendous importance in the defense program. There was a shipyard in New Orleans, one in Memphis, Tennessee, and too many defense plants and installations directly supporting the war effort to mention located along the Mississippi River system. New Orleans was also a port of debarkation. It became evident early in the War that the Gulf of Mexico at the mouth of the river was a prime area for enemy submarine operations. Several ships were destroyed just as they emerged from the river channel into open waters.

A tight blanket of security was spread across the river delta area and the Mobile District constructed temporary gun mounts and observation towers in 1942 to combat the submarine menace. There were also shipyards at Pascagoula, Mississippi, two in Mobile and one in Panama City, Florida. The Pensacola Navy Yard and Naval Aviation Training Center made that city a prime target. Temporary gun mounts were constructed to protect each of those locations.

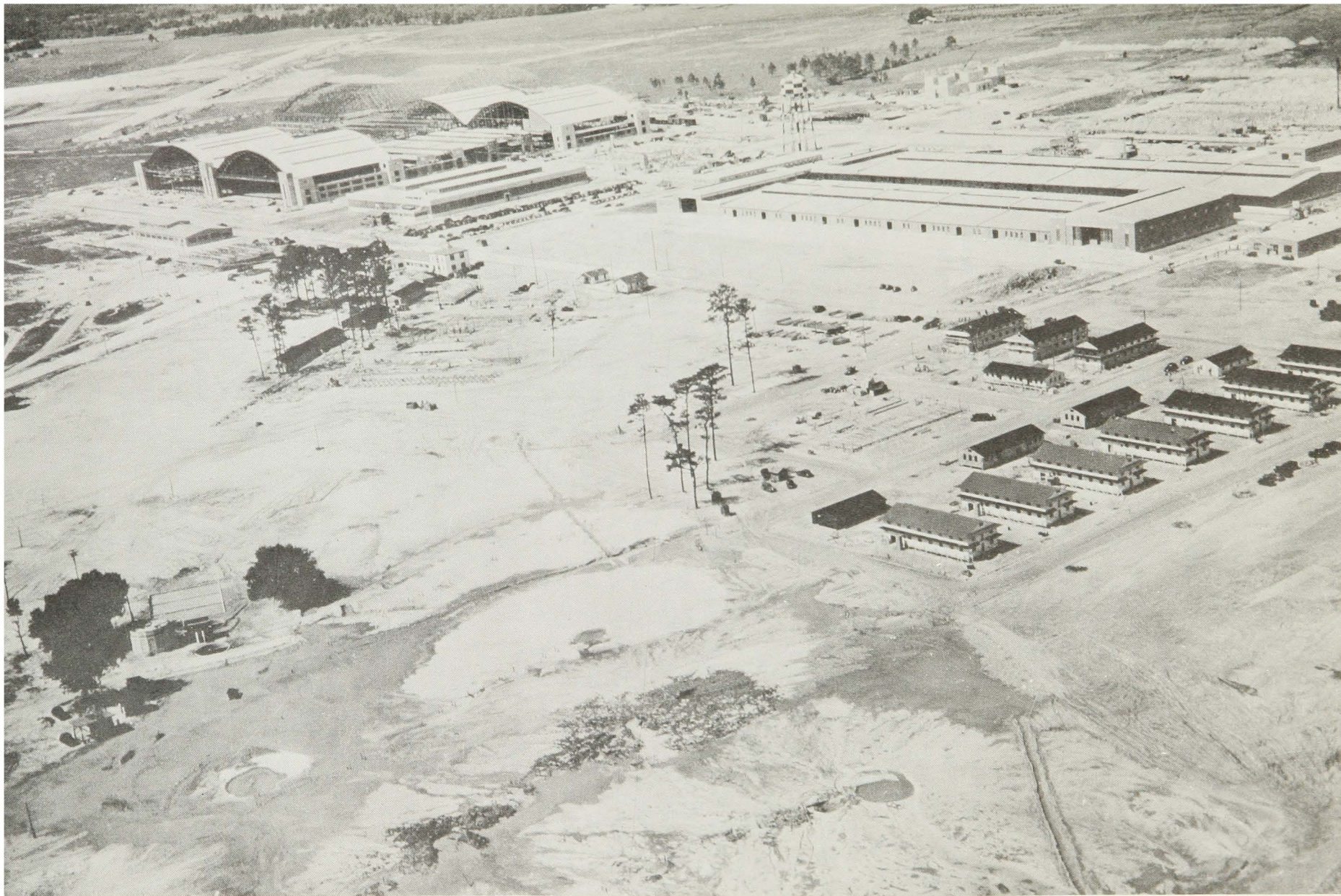
There was only one exception to the temporary gun mounts constructed in this system of defense, Battery Langdon on Santa Rosa Island, Florida. This massive

casemated battery was constructed to give protection against an invasion from the Gulf. The gun mounts permitted only a limited sweep of protection. There was considerable doubt about the practicality of the project from the beginning. Just as the project was completed, word was received to construct all such batteries with a 360 degree gun sweep. Singapore batteries had just fallen, having been attacked from the landside and Battery Landon had no land-side gun support, but, fortunately, it was never needed for actual defense.

The Port of Mobile was extremely important for reasons other than the shipyards. Brookley Field was constructed on Mobile Bay and a large percentage of the national requirements of alumina used in the manufacture of aluminum, certain abrasives, ceramics, electrical insulation, refractories and other items was manufactured by Alcoa in Mobile. Mobile was, in addition, a brisk trade center served by rail, air and water transportation facilities. The city engaged in vast foreign and domestic trade. The newly constructed State Docks greatly facilitated the trade. It was easy, therefore, for the local population to assume that Mobile was a prime target for enemy activity, and to believe any rumor concerning such.

Since tight security regulations were maintained and strict censorship of news relative to military activities was imposed, it was impossible to separate fact and unfounded rumor. It was known that submarines operated in the Gulf of Mexico, however, and rumors that Germans frequently came ashore to make purchases were readily believed. When it was rumored that a submarine had been captured off Mobile Bay with fresh bread from the local Smith's Bakery and that a copy of the current *Mobile Register* were found on board, it was generally accepted as fact.

It became public knowledge that a very large French tanker, the *Scheherazade*, was destroyed just beyond the Sand Island Light off Mobile Bay early in 1942. Also in the spring or summer of 1942 three lifeboats were towed into Pensacola Harbor loaded



BROOKLEY AIR FORCE BASE UNDER CONSTRUCTION
SEPTEMBER 1941

with the crew of a U. S. freighter which had been sunk at some undisclosed area in the Gulf of Mexico. The crewmen were badly sunburned and appeared to have been on the water for several days.⁵

A war-time atmosphere had settled upon the Mobile District early in 1942. There were apprehensions about prospective invasions or air attacks, and the *Safety Beacon* carried articles on how to drive during a black-out and how to conduct oneself during an air raid. There was also a great upsurge of patriotism and participation in bond drives. There were longer work days and work weeks as the District geared itself to meet the demands of total war.

Colonel Ludson D. Worsham (1941-1942) was District Engineer when Pearl Harbor was attacked 7 December 1941, and led the District through the transition to a total war operation. Before the attack all district officers had worn civilian clothes, but on 8 December 1941 they reported for work in uniform. It was during Worsham's tenure that the Corps offices, formerly scattered among several buildings, were brought together at the new temporary construction type office complex on Airport Boulevard.⁶ This was destined to be the home of the Mobile District for over thirty years before a permanent, modern office building was approved for construction in downtown Mobile, but still not built at the time of this writing.

It was also during the tenure of Colonel Worsham that Brookley Field, Southeast Air Depot, Air Material Command, was expanded. Brookley Field was initiated by Colonel Willis E. Teale, District Engineer, 1940-1941, and Colonel Worsham's predecessor. The project was placed under the direction of Major George J. Zimmerman early in 1942 as field engineer. Brookley Field proved to have been the most important project of the war as far as economic impact on the Mobile community was concerned, and was destined to continue until the latter years of the 1960's.

Colonel Worsham was succeeded by Colonel Doswell Gullatt (1942-1943), who

directed the District during the tremendous increase in the military workload. He was a native of Sinsboro, Louisiana, a graduate of Marion Military Institute, Marion, Alabama, and a 1918 graduate of West Point. The wealth of military engineering experience during his long career with the Corps of Engineers qualified him for much needed services overseas and he was transferred in 1943. He was later officially cited for his services in the operation of an Allied supply port at Antwerp, Belgium, then designated the 13th post.⁷

Colonel Gullatt was succeeded by Lieutenant Colonel Herbert L. Collins, the only civilian ever to have been appointed to the position of District Engineer. His tenure (1943-1945) was unique in two ways. First, it was directed by a civilian; and second, it was a period of peak accomplishment and expenditures.

Collins came to the position well qualified. He was described in 1942 as having held every designation available to a civilian engineer in the Mobile District. He had progressed from the designation of Recorder to Principal Engineer, the highest designation available to a civilian in the District. He had also held positions other than those specifically identified with the engineering profession. He had "a knowledge of the work that is very seldom found in any one official."⁸

He was commissioned a Lieutenant Colonel shortly after World War II opened and was assigned District Engineer in June of 1943. After the close of the European conflict when regular Army officials were again available, Collins was succeeded by Colonel Mark M. Boatner, Jr., but was designated chief executive assistant. He was later restored to his former status as principal civilian assistant.⁹ Colonel Boatner, decorated many times for his outstanding services in the Italian campaign and elsewhere, guided the District through the period of adjustment to a peace-time operation.

Colonel Boatner was well suited to lead the District during this period of transition

from a military atmosphere to civilian oriented programs. He had a dynamic and colorful personality, but approached his task in a most non-militaristic fashion. He was far less concerned with military regulations than had been traditionally true of District Engineers. With the nation out of the conflict and determined to return to a peace-time society, he was a refreshing leader.¹⁰

The construction projects of those war years were largely of a temporary construction type designed to be used only for a limited time. This was true of Army and Army Air Corps camps, prisoner of war camps, some hospitals, ordnance works, and numerous other projects, including temporary housing to accommodate workers in areas of concentration of projects. In 1950, the Engineering Division listed only twenty permanent military installations in the District despite the fact that nearly 300 construction projects had been accomplished.¹¹ Because of the temporary nature of the construction and the assumption that the military build-up would last only for the duration of the War, World War II projects were destined to have far less lasting impact on the Mobile District than those of the Korean Crisis which opened in 1950.

Not only were the World War II responsibilities the greatest ever imposed upon the District, but they had to be accomplished under adverse circumstances. There was a great shortage of manpower and materials. Persons possessing skills could improve their salaries by moving from one job to another. Since much of the work was accomplished on a cost-plus-fixed-fee basis, there was a tendency for contractors to pay whatever salaries were necessary to secure the skills needed. Contractors were also under great pressure to meet deadlines and they had to secure skilled laborers. Order and stability were finally established by freezing people on their jobs, by vagrancy laws which required all able-bodied men to be gainfully employed, and by employing women in many areas which were formerly filled by men.

Women became welders in shipyards and

were employed as truck and bus drivers, and in many other areas formerly reserved for or traditionally filled by men. Despite the tremendous drainage on manpower by the large number of men and women in uniform, production capacity continued to increase throughout the war and productive ability was still on the increase at the end of the war.

The shortage of materials was a more serious problem, but somehow the necessary resources were acquired to accomplish the tasks. Transportation facilities were overtaxed and the demands of war created a shortage of petroleum products, rubber, and other items of civilian consumption. Rationing, restriction of unnecessary travel, abolition of sports events and many types of public recreation, and giving strict priority to military needs in every area of national life enabled the nation to meet the demands of the occasion.

Construction projects included complex training camps such as Camp Shelby, Mississippi, which developed a capacity for 90,000 troops. There were many others of considerable magnitude. With the time element of utmost importance, the Mobile District, of necessity, resorted to cost-plus-fixed-fee contracts to accomplish some of its responsibilities.

Most of the construction was of a routine nature from an engineering point of view; that is, the same type of barracks were built all over the nation. There were few problems of design and technology, and once completed, the projects were turned over to the Using Agency and the Corps assumed no further responsibility unless expansion or modification was required. The great problems came from the necessity for speed and the difficulty in securing materials and labor.

The Mobile District did engage in two unique operations not generally known to the public. One was the construction of bacteriological warfare research facilities on Cat Island off the Mississippi coast and the other was the firing of the first missile to have been fired in America.



COLONEL HERBERT I. COLLINS
DISTRICT ENGINEER, 1943-1945

The Cat Island project was classified and those responsible for construction were given no information concerning the use to be made of the facility. They simply followed the blueprints and constructed cages and corrals to accommodate a variety of animals, and research laboratories. That project, like so many others of the District, proved to have been temporary. How much it was utilized is not known, but it was abandoned at the close of the war.

The missile firing was a single event operation. One of Germany's first missiles employed in warfare was the Vengeance Weapon one or V-1, popularly called the buzz-bomb. It was 25 feet, 4 inches long and was capable of carrying one ton of explosives. It could go 150 miles at a speed of 360 miles an hour. A magnetic compass and clock mechanism controlled the flight of the V-1. After a preset distance had been covered, the clock locked the missile's elevators and diverted it into the ground. Defense fighter planes shot down the V-1's rather easily because of their rather slow speed. A V-1 and its launching tube was captured in Paris in 1944, and was transported to Santa Rosa Island for testing. During the next few weeks, engineers of the Mobile District were assigned the task of making blueprints so that copies of the missile could be made for experimental purposes and assisted in the firing of models. The Special Weapons Division of the Army directed the operation assisted by Eglin Field. Blueprints were made of all parts and flown to Washington where they were manufactured. Missiles were assembled, launch-

ing tubes were made, and some 15 missiles were tested.

The launching tube, between 250 and 300 feet, had a slit on the top and the missile rode a carriage propelled by hydrogen peroxide provided by the Aberdeen Ordnance Plant. The first attempted firing failed. The missile fell from the tube, and there was fear of an explosion. All told, about one-third of those attempted were successfully fired. Some exploded on the firing range, but there were no injuries.¹²

The Germans began use of the more terrifying rocket-propelled V-2 in September 1944. It was produced under the direction of Wernher Von Braun, who came to the United States after the war as technical advisor for the U. S. Army. His career was destined to be pursued in the Mobile District.

Japan surrendered to the United States aboard the USS *Missouri* in Tokyo Bay on 2 September 1945, and World War II had ended. The Mobile District entered a new type of responsibility, that of demobilization.

Air bases, Army camps, Ordnance plants, Prisoner of War camps, United Service Organization facilities (USO), hospitals, depots, warehouses, and numerous other facilities so recently completed under trying conditions were phased out. The Mobile District was engaged in preparing separation centers, National Guard and Organized Reserve facilities and other military responsibilities. The real area of responsibility was civil projects which were tremendously expanded at the end of the war.

CHAPTER X:

THE KOREAN CRISIS AND AFTER

The United States did not return to isolationism following the close of World War II. The oceans no longer afforded real protection. The United States could not ignore the necessity of a balance of power in Europe and Asia, and the role it must play in maintaining this balance. Great hopes were placed in the United Nations organization formed in San Francisco in 1945 to establish and maintain a program of collective security for the world.

The fifty nations which signed the United Nations Charter agreed to employ "collective" measures for the prevention and removal of threats to peace. This included armed force if peaceful measures failed. The United States assumed responsibility for maintaining sufficient military power to permit an effective contribution to any U. N. force that might be necessary. Beyond this it was impossible to foresee the requirements for national security in the immediate postwar period in a drastically changed world. The shape and size of the military establishment could not be determined. Two problems faced the military establishment, both of which would greatly affect the Mobile District. The immediate task was that of demobilization and the second, deciding the size and composition of the postwar military establishment.

The Army, Navy and Air Force developed specific programs for demobilization based upon an individual basis, each man receiving point credit for length of service, combat participation, overseas service, and parenthood. Available transportation and time required to process discharges were taken into consideration and the program provided for an orderly demobilization.

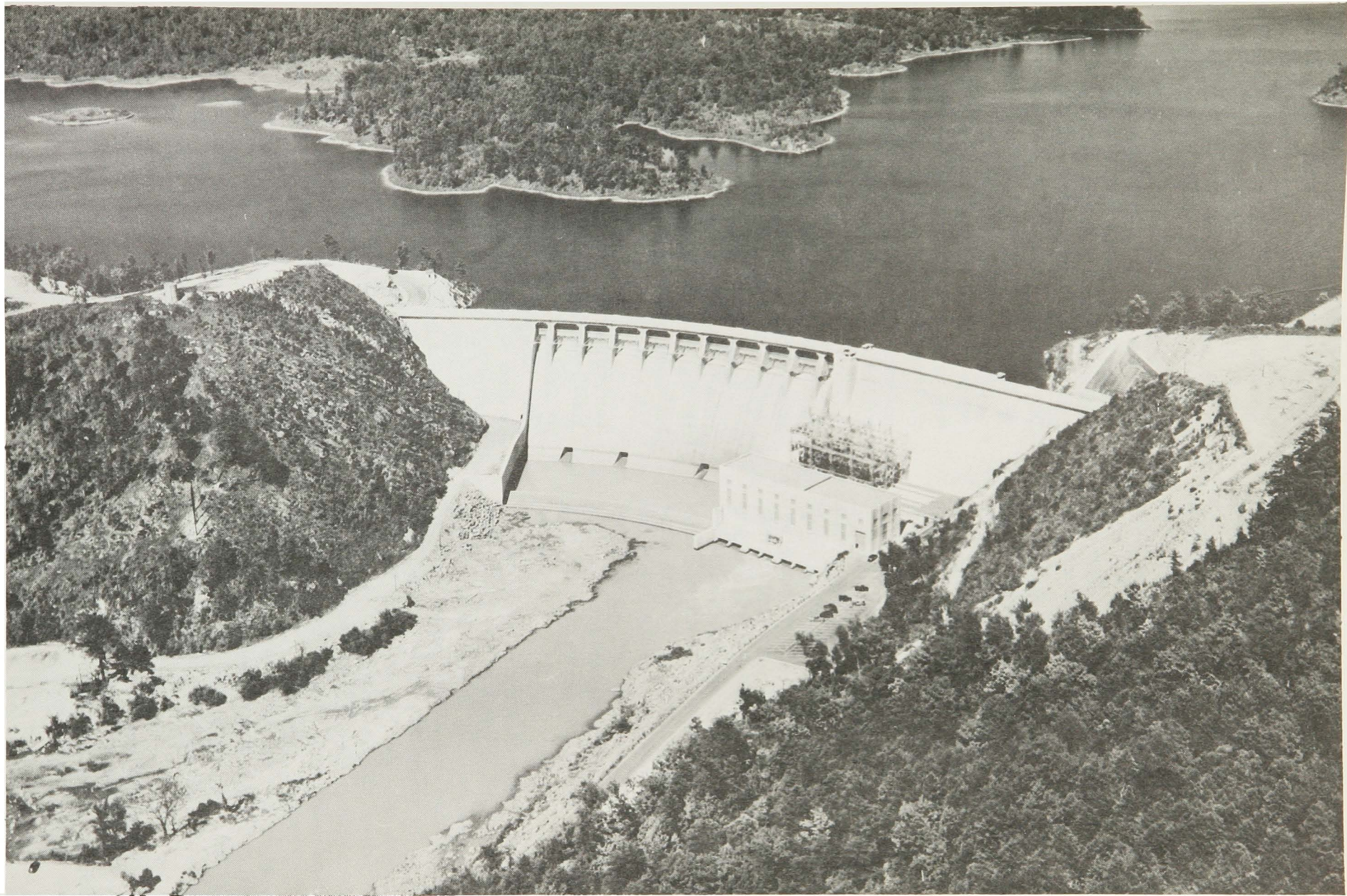
The Congress, public, and the troops, themselves, created great pressure for faster demobilization. The program for an orderly return to civilian life was upset and withdrawal of troops from abroad was greatly speeded up. When the Army cut down the return of troops in early 1946 in order to

meet its overseas responsibilities, military personnel demonstrated in the Philippines, China, England, France, Germany, Hawaii and even in the States. The crescendo of protest diminished only after the Army cut its remaining strength abroad by more than one-half. This meant that the Mobile District was thrown into a rapid program of phasing out and disposing of facilities. This responsibility fell largely to the Real Estate Division. Political pressures prevented a realistic approach to military requirements.

As the military responsibilities diminished, the District adjusted rapidly to a vastly expanded civil projects program. The cold war which was initiated by the Communist bloc nations after World War II could be executed without any major additional responsibilities from the Corps of Engineers. The situation changed suddenly and dramatically when North Korea, a Communist bloc nation, crossed the 38th parallel before dawn, Sunday 25 June 1950. The great power blocs, the Communists and the free world nations, were pitted against each other in a new type of warfare--the policing action or limited warfare concept.

The Mobile District had become adjusted to the civil projects and was unprepared for the sudden military demands. As had been true at the opening of World War II and again at the end of the war, there was another sudden shifting of emphasis. At the opening of the Korean conflict, the Mobile District was engaged in the construction of the Allatoona Dam, the Jim Woodruff Lock and Dam, the Demopolis Lock and Dam, the Buford Dam and the Birmingham V.A. Hospital. Plans for extensive improvements of the Black Warrior-Tombigbee and the Alabama-Coosa river systems were underway. The plans were also progressing for the construction of the much discussed and now approved Tennessee-Tombigbee Waterway.¹

The District staff on 30 June 1950 consisted of four officers, only one of whom was assigned to military work. There were 1,020 civilian employees and 91 of those were on



ALLATOONA DAM AND POWERHOUSE, ETOWAH RIVER, GEORGIA

military payroll. Military contracts amounting to slightly over \$4,000,000 were in progress when the conflict erupted.² This included a contract for 100 non-commissioned officers' family units at Keesler Air Force Base, 80 family units at Fort Benning, and a number of less important projects.

Military engineering work in the pre-Korean conflict period consisted largely of specifications for National Guard armories, alterations and rehabilitation of existing facilities for use by the National Guard and organized Reserve Corps. Considerable work was being accomplished on rehabilitation and new construction for national cemeteries, instrument landing systems and ground approach systems at several Air Force bases. The military projects contributed little to the requirements of the sudden crisis.

At this time, the Mobile District was responsible for military projects in Alabama, Mississippi, Tennessee, northwest Florida, and Fort Benning, Georgia. The projected budget requirements for the Mobile District for fiscal year 1951 was between \$5,000,000 and \$6,000,000 including procurement of military supplies.

Advance notices of military construction following the opening of the Korean Crisis rapidly increased the District workload to approximately \$100,000,000. Projects considered urgent included rehabilitation work at Camp Rucker, Fort Benning, Fort McClellan, the Holston Ordnance Works and Wolf Creek Ordnance Plant. Also important were the construction of an electronics laboratory and additional troop housing at Keesler Air Force Base, construction of additional facilities for the Armament Test Center at Eglin Air Force Base, and an acceleration of the rocket research and development facilities at Redstone Arsenal. The bulk of the budgeted funds were for civil projects and personnel was assigned to those projects by the time this increased workload had been received. The District was not prepared for the task thrust upon it. The shock of added responsibilities was nothing compared to those assumed at the opening of World War II, however, and the shift in

emphasis was taken in stride.

The large civil works program in the District had resulted in the retention of much manpower previously assigned to the military who, therefore, had had previous military construction experience. Those could be easily reassigned to military construction. The large civil works program had kept the overall District capability strong, and ready to accomplish any construction mission of reasonable magnitude.

The work of the Mobile District in meeting the crisis fell largely within three areas of activity. Those were real estate, rehabilitation of existing facilities, and construction of new facilities.³ Those areas will be discussed in the order noted.

Prior to the opening of the Korean conflict, the Real Estate Division was engaged primarily in the acquisition of property for the vast post-war river, harbor, and flood control projects. There was also a brisk program of leasing space for organized reserve units and for recruiting stations. The vast majority of the real estate requirements were for civil projects and at the opening of the 1950 fiscal year it was anticipated that there would be only moderate efforts in military acquisitions—only enough to keep pace with a few minor military construction projects.

The Korean crisis was not immediately reflected in an upsurge of real estate activities. Disposal of all Government-owned land and improvements was stopped for the time being, and the outleasing of all facilities of possible military usefulness was curtailed. Outleases already accomplished at Redstone Arsenal, Huntsville, Alabama; Milan Arsenal, Milan, Tennessee; and Holston Arsenal, Kingsport, Tennessee; were revoked to make way for rehabilitation of standby facilities. The Korean situation also resulted in the initiation of a real estate planning program for proposed new construction.

Real Estate initiated reacquisition proceedings for several airfields which had been formerly used by the Air Force, but released. Now they were needed in the

training program. Since they were largely municipally owned, acquisition was fairly simple and rent was nominal. Such fields were acquired at Starkville, Greenville and Indianola, all in Mississippi, and at Demopolis, Alabama.

The Real Estate Division experienced no serious delays, but some difficulty was encountered in regaining occupancy of ordnance facilities which had been leased to private industry. Long court proceedings were required in one case involving a bankrupt case and another where default in rental payments had occurred. Commanding officers of the installations affected were advised by the Division Engineer of the proper steps to be taken in future cases where leases were to be revoked and little trouble was encountered thereafter.

As a result of the increase in military requirements, approximately 50% of the personnel engaged in civil works within the Real Estate Division were shifted to military projects. This still did not meet the requirements of the Mobile District, and qualified appraisers were employed under contract to supplement those under employment of the District. Since the civil projects had been so active prior to the Korean crisis, very little augmentation of personnel was necessary elsewhere and reassignment of employees enabled the District to meet the new objectives in most areas of responsibilities.

The rehabilitation of existing facilities created many more problems for the Mobile District. This was due primarily to the need for immediate occupancy by troops. A total of 73,990 troop spaces were provided through the emergency program initiated in the late summer 1950. A program initiated at Camp (later Fort) Rucker 24 August 1950 provided 26,418 spaces. Troops began arriving 15 September 1950, and continued through 2 December 1950. This completed rehabilitation of Fort Rucker except for the Tank Hill area. This section was made ready for troops through a program initiated 20 December 1950 and was ready for occupancy on 15 January 1951. This program added 7,232 additional troop spaces.

Camp Rucker presented many pressing

problems, most of which were due to the nature of the work. There was need for haste to provide housing for individuals being ordered to duty. There was little time for adequate inspection, preparation of detailed plans and specifications and for letting contracts. The problem was further compounded by the hidden nature of much of the deterioration of buildings left unused for several years. Problems were aggravated by the arrival of troops ahead of the scheduled date and before accommodations could be prepared.

The District Engineer instructed a party to visit Camp Rucker, Fort Benning, Camp McClellan, and Maxwell Air Force Base on 25 July 1950 to confer with Using Services about rumors of reactivation of the facilities. The South Atlantic Division Engineer advised the Mobile District Engineer, Colonel Walter K. Wilson, Jr., by telephone on 8 August to initiate urgent full-scale restoration programs at Camp Rucker. No authority had been received from the Chief of Engineers at that time.

A second field party, therefore, departed for Camp Rucker that day to develop engineering data. Brochures of a large number of contractors were reviewed and some forty qualified, experienced firms which were in a position to take on additional work on short notice were contacted in person or by telephone regarding their interest in rehabilitation work at Camp Rucker. The Division Engineer advised the Mobile District that the camp would definitely be reactivated on 10 August and that an estimated \$1,500,000 worth of contracts would be required. Field engineering work was completed 11 August and the next day Headquarters, Third Army, advised the District Engineer by telephone that Camp Rucker was approved for reactivation and that work should be accomplished at maximum speed. Target date for occupancy was placed at 25 September. A resident engineer office was established at the Camp on 12 August and Colonel Wilson, District Engineer, decided that plans and specifications would be completed by 16 August, that contractors would be invited to meet at the Camp on 17 August and that offers would be received on 21 August.

Representatives from the Mobile District and Headquarters, Third Army met on 16 August to determine actual work to be accomplished, and funds were made available the next day.

Bids were received 21 August and contracts were let on the 22nd. Contractors encountered an unexpected problem when the construction was initiated. Many of the buildings at Camp Rucker had been constructed without eaves. Rainwater had run off the roofs directly onto the siding and worked its way into the wall framing at the window and door openings. The gypsum sheathing became saturated and remained that way, and the studs, siding, sole plate, and headers, being in direct contact with the wet sheathing, had decayed. This condition delayed completion of the rehabilitation and increased the cost. Buildings with overhanging eaves required little repair.

The real problem and confusion at Camp Rucker was the arrival of troops in advance of scheduled time, thus before their quarters were ready. The Using Service further insisted that each unit be housed in the quarters originally assigned to them. This forced the contractor to pull crews off other areas in order to complete areas to be occupied by incoming troops. The contractor's plan of operation was disrupted and workmen were overcrowded in limited space. Inefficiency and poor quality workmanship resulted, some of which had to be corrected later. All effort to get the predetermined time of arrival respected failed, and the problem was never completely solved. The problem had retarded overall progress and had increased cost to the contractor. The project was accomplished with amazing speed, however, and the facility was in use in record time.

Rehabilitation programs were also accomplished at Fort Benning, Georgia; Fort McClellan, Alabama; the Wolf Creek Ordnance Plant and Holston Ordnance Works, Tennessee; Camp Stewart, Georgia; Camp Gordon, Georgia; Fort Jackson, South Carolina; and a number of other facilities, each presenting its own unique problems plus the one common problem -- haste. New construction projects also had their problems.

New construction projects included barracks and an electronics laboratory with 98 classrooms with a capacity of 30 to 50 air-men each at Keesler Air Force Base, Mississippi. Interim facilities at Eglin Air Force Base, Florida, which included 26,000 square feet of office and laboratory space, 32,000 square feet of hanger and office space, and operational space for the Bee Line System, were built. Two completely new assembly lines at Holston Ordnance Works with additions to two others were constructed. There was an acceleration in the development of rocket research facilities at Redstone Arsenal. Work accomplished at Keesler Air Force Base is a good example of the Mobile District's accomplishments under difficult conditions.

Most of the problems at Keesler were caused by the need for haste. A directive was received 25 September 1950 for the construction of facilities costing in excess of \$6,000,000, which included quarters, an academic building (electronics laboratory and classrooms) and the relocation of a motor pool. The completion date was set at 31 December 1950. The electronics laboratory was one of the first of its kind to be constructed in the nation and the architectural and engineering services had not been accomplished.

A firm with a large staff of architects and engineers was awarded a lump-sum contract to perform those services. In the interest of time a cost-plus-fixed-fee (CPFF) contract for this construction was let through special authority from the Chief of Engineers. The Mobile District, the Commanding General at Keesler, and the office of the contracting firms worked in close cooperation and maintained good liaison, and were able to resolve many of the difficulties. The District representatives visited the engineering firm several times a week to review plans and forward information directly to the resident engineer at Keesler. Materials were purchased as soon as their need was known and construction was initiated and progressed, keeping pace with production plans.

The liaison noted above was expanded as the project progressed. When preliminary

plans were completed, the office of Chief of Engineers, Division office, and the Department of the Air Force sent representatives to the Mobile District Office to meet with the Mobile District and the Commanding General of Keesler to discuss and approve the plans. Many conflicts were thereby resolved and problems eliminated which would have resulted in costly delays. The office of the Chief of Engineers also worked closely with the Mobile District in negotiating a CPFF contract with Ewin Engineering Corporation, a Mobile, Alabama, based firm. This was the first CPFF contract negotiated in the nation during the Korean emergency. The authority to negotiate such contracts had been suspended after World War II and special authority had to be secured. The Office of the Chief of Engineers gave the authority and sent a strong team to assist in finding answers to difficult questions concerning procedure and hastened agreements.

One problem experienced in construction of the laboratory was the delays occasioned by strikes because union labor objected to the operations of an open shop contractor. Another was the necessity of having to accomplish construction in the midst of the concentration of large numbers of troops in a restricted area. There was a particular problem of storing and moving materials. The problem was resolved somewhat by scheduling the movement of materials when the airmen were changing classes.

The CPFF contract and the fact that the contracting firm, Ewin Engineering Corporation, was located in Mobile, greatly facilitated the construction of the electronics laboratory. This academic building was something of an innovation. It was a two-story, windowless, masonry building, completely air-conditioned and had acoustical treatment on the ceilings. The 98 classrooms were complete with chalkboards and multi-frequency and voltage electrical outlets for electronic equipment. Since this building had no precedent, it had to be designed from the foundation up.

The academic building was started under letter order, and the design accomplished

by the architect-engineer firm Converse & Johnston. Procurement of materials and construction proceeded simultaneously. Construction actually began three days after the letter order, and progressed as rapidly as several factors permitted, such as design, criteria, foundation determinations, and recruitment of qualified personnel. Many items of equipment had to be modified or laboratory-tested to meet rigid requirements for this special laboratory. In spite of all those factors, inherent in this type of rush job, construction progressed rapidly and orderly.

Excessive cost was avoided by persistent and close supervision by the principals in the construction firm's home office and by the field forces of the resident engineer. The building, costing \$2,439,908, was completed in only 270 days. Two buildings completed at a later date were constructed for about \$100,000 less each, but they were built under more favorable conditions, had the experience of the first project from which to draw, and were not subjected to the same rush job pressures.

The second and third academic buildings were awarded to the J. A. Jones Construction Company of Charlotte, North Carolina, under lump-sum contracts. This contractor had the advantage of design in hand, equipment modifications for the first building were applicable to those, and suppliers of materials had determined realistic costs. Also labor in the area had acquired a degree of skill in this type of construction. The contractor had the advantage of a completed building for his examination. By the time the first academic building was completed, solutions to most problems had been found. Other new construction projects had their unique problems, but those were met through cooperation of the Using Service, the Office of the Chief of Engineers, the Division Engineer, and that of the Mobile District.

The funding of the emergency projects presented problems because of the time element. There was not sufficient time to prepare for formal advertising. The nature of the rehabilitation projects, especially



ACADEMIC BUILDING (ELECTRONICS LABORATORY)
COMPLETED AT KEESLER AIR FORCE BASE IN 1952

the large number of variable items, made formally advertised contracts impracticable. The Corps negotiated lump-sum agreements. The Using Agency had required beneficial occupancy at the earliest possible date. By use of the telephone contacting of contractors, on the spot inspections, and emergency funding, the Mobile District was able to have actual construction work under way at Camp Rucker in less than two weeks.

The cost-plus-fixed-fee contracts lent themselves to inefficiency in both procurement and in construction unless honest and efficient contractors were found. Careful supervision by the Mobile District, especially through the staff of the resident engineers, and the central office of the contracting firms kept unnecessary expenditures to a minimum. Experience from World War II contracting contributed to efficiency in the Korean crisis and by mid-1951 most of the work had become fairly routine. The Mobile District accomplished about \$25,000,000 in military work during the fiscal year 1951, and carried over about \$70,000,000 which was under directives existing at the end of the year. Advance notices had already been received calling for over \$200,000,000 in additional military projects for fiscal year 1952. Much of this was for new work on Air Force Base expansion.

As the Mobile District approached the 1952 fiscal year, advance notices were received for possible programs which would have increased the total workload to over \$500,000,000. Higher authorities decided that too much of the total Corps workload was being channeled into one District. Geographical responsibilities for the military projects of the various districts were ordered changed. The Mobile District workload was considerably reduced. Military supply activities were transferred to the New Orleans District in March 1951. Many procurement personnel were released from that responsibility and transferred to construction projects. Fort Benning, the last military project in Georgia to have been assigned to the Mobile District, was transferred to the Savannah District 1 April 1951. All military responsibilities in the state of Tennessee were trans-

ferred to the Nashville District in May 1951.

At the opening of the 1952 fiscal year, new work contracts were in force at Craig, Eglin, Henderson, Keesler, and Tyndall Air Force Bases; Anniston Ordnance Depot, Memphis General Depot, Redstone Arsenal and at the Muscle Shoals Chlorine Caustic Plant and the Phosphate Development Works. By that time, the most urgent construction, both new and rehabilitation, was under contract. All construction contracts subsequent to 1 July 1951, with only a few exceptions, were made after traditional formal advertising.

The Korean conflict ended in July 1953. By that time the Mobile District had become adjusted to conditions imposed by the crisis, and was accomplishing its vast civil and military responsibilities smoothly. The close of the conflict did not result in a rapid demobilization as that which followed World War II. Air Force bases continued to be expanded and military capability was approached more realistically. The United States placed much greater emphasis upon its relation to the North Atlantic Treaty Organization (NATO). The outbreak of war in Korea resulted in fear of another general war, and the free world bloc nations determined to increase their military capabilities. After the war, NATO could call on fifty divisions and strong air and naval contingents. The United States had become geared to military preparedness and a war-time economy. This was reflected in the future workload of the District.

The Mobile District found it necessary to adjust to emergency conditions on short notice in 1950. This was done and projects were completed in record time, meeting the urgency of the situation. Methods of contracting were modified in the interest of time, and contracts were negotiated and accomplished in far less time than is required under formally advertised contracts.

The Korean crisis demonstrated again that the Corps of Engineers were able to meet the demands of the occasion. The strength of the nation in meeting war-time

demands is found in the giant organizations capable of making a transition from civil to war production on short notice. Such organizations include General Motors, Ford Motors, Western Electric, United States Steel and many other industrial corporations. Along with those is the Corps of Engineers. Having extensive civil responsibilities and capabilities in normal times, it is able on short notice to make the transition to meet emergency demands in time of peace, as Hurricane Camille in 1969, or in time of war.

All new work projects during the Korean conflict were of a permanent nature. They represented the nation's adjustment to the new concept of preparedness and military capability. Air Force and Army facilities re-established during the Korean conflict have been maintained. This has assured the Corps

of Engineers continuous involvement and workload. New facilities must be added and old ones replaced to meet the demands of changing technology and ravaging of the elements.

In 1961, all military construction in Tennessee was restored to the Mobile District, extending its military responsibilities to virtually as they had existed during World War II. Military construction will continue to be a major District responsibility until there is a dramatic change in the domestic and international political climates. This includes expansion and modification of the large number of installations within the Mobile District. Contracts have been negotiated and responsibilities continually accomplished every since the nation has settled down to a war-time economy following the Korean conflict.

CHAPTER XI:

THE GUIDED MISSILE PROGRAM

The Mobile District became involved in the guided missile program first at Redstone Arsenal, Huntsville, Alabama. Redstone Arsenal is located just south of Huntsville on a reservation containing about 39,000 acres. It is one of eight permanent Ordnance Corps arsenals, but is the only one to be devoted almost exclusively to the missile program. It is engaged in research, testing, and development of guided missiles, rocket weapons, and propellants.

The arsenal was established in 1941 adjoining the Huntsville Arsenal. During World War II the two arsenals produced chemical shells. Huntsville Arsenal manufactured and loaded the shells and Redstone assembled explosives for them and produced rounds. In 1948 the two were consolidated into a single installation known as Redstone Arsenal. By that time operations had been curtailed as the Nation reverted to peacetime programs. The Mobile District had accomplished construction of the two facilities at a cost of about \$90,000,000.

The Ordnance Rocket Center was placed at Redstone in July, 1948, and in mid 1950 the guided missile research and development facilities and personnel were moved from Fort Bliss, Texas to that installation. Wernher Von Braun, considered the foremost rocket engineer in the world, headed a research team which brought more than 100 German scientists and their families, among many other persons, to the Arsenal.

Early in 1956 the Army Ballistic Missile Agency was established at Redstone. The United States Army Ordnance Missile Command was created in 1958 to consolidate and simplify Army missile work and the headquarters was placed at Redstone. The Ordnance Guided Missile School and a number of other agencies engaged in various phases of the guided missile program were also located at the arsenal.

The establishment of the guided missile center at Redstone necessitated an extensive

building program. It had just begun when the Korean invasion occurred, and was speeded up during that conflict and continued until the lull following the successful moon flights.

The Russians launched the first earth satellite, Sputnik I, 4 October, 1957. Russia was progressing more rapidly in space travel than the United States, and placed the first man in orbit in 1961. About a month later U. S. Astronaut Alan B. Shepard, Jr. made a 15 minute space flight. It was almost a year before the United States put men in orbit.

Following Sputnik I, the United States accelerated its space program, and because of its geographical location, the Mobile District received much of the workload in providing the research and development facilities. Between 1950 and the launching of Sputnik I in 1957, the Mobile District constructed facilities costing \$42,000,000 at Redstone, and had an additional \$21,000,000 under contract. The great interest in space travel, and the embarrassment of the United States at the superiority of Russia in the conquest of space, resulted in a great thrust forward.

America's response to Sputnik I was the establishment of the National Aeronautics and Space Administration (NASA) in October 1958 to coordinate and facilitate missile progress. Most of the rocket-related activities of the United States in 1957 were centered around the Intercontinental Ballistic Missiles (ICBM's) and the Intermediate Range Ballistic Missiles (IRBM's). Three military services and their respective industrial contractors were carrying on the activities. The Air Force was developing the Atlas and Titan ICBM's and the Thor IRBM; the Army the Jupiter IRBM; and the Navy the Polaris IRBM.

When Sputnik I orbited the earth, the United States had only one operational missile of any size, the Army's 200-mile tactical Redstone missile. Before the public could recover from the shock of Sputnik I, Russia launched Sputnik II, 5 November 1957, weighing over 1,100 pounds, six times the

weight of Sputnik I. Public concern for America's national image and military preparedness soared. Russia was obviously more advanced in space technology than the United States.

President Dwight D. Eisenhower made a major speech 7 November to allay public fears. He declared U. S. defenses sound and declared that the United States had made a "breakthrough" by perfecting a nose cone capable of surviving re-entry into the earth's atmosphere. He further announced the creation of the President's Scientific Advisory Committee. This committee played an important role in the establishment of NASA.¹

In succeeding months distinctions were developed between the militarily significant ballistic missiles and the more scientifically significant earth satellites. The outcome of the debates in executive circles and in Congress was the creation of NASA to conduct the civilian space activities, and the Department of Defense (DOD) was assigned all military or ballistic missile activities. The NASA headquarters were established at Washington, D. C.

The Von Braun team at Redstone developed the Saturn super booster rocket and most of its program revolved around the Saturn. The Army, however, had no need for this super booster and consideration was given to transferring it to the Air Force. Investigation revealed that even the Air Force had no immediate need for it. NASA's program, on the other hand, would need such and its own Nova launch vehicle was still far in the future. NASA assumed responsibility for the Nation's super booster, the Saturn, 21 October 1959. The Army Ballistic Missile Agency's Development Operations Division, was transferred to NASA.

A new NASA organization was established at Redstone Arsenal and the Saturn program came with it. This new organization was housed in the George C. Marshall Space Flight Center, and it became the largest single agency of NASA. This transfer gave the Mobile District its greatest new responsibility. Not only did it result in increased

activity at Redstone, but it resulted in the Mississippi Test Facility being located in the Mobile District.

By 1960 the United States had launched an all-out effort to lead the world in space exploration. NASA established three centers through which to accomplish its tasks. The Marshall Space Flight Center as noted was at Huntsville. The Manned Spacecraft Center was established at Houston, Texas, for astronaut training and flight control. The Kennedy Space Center, Florida, was developed for vehicle launch.

The Michoud Assembly Facility at New Orleans was established as a support activity for the Marshall Center. The booster rockets were assembled there. There was need for a test site nearby, accessible by water, for static firing of large rocket stages. It was announced by NASA 25 October 1961 that a site had been selected 40 highway miles northeast of Michoud, largely located in Mississippi, but extending briefly into St. Tammany Parish, Louisiana. This Mississippi Test Facility was destined to require a major portion of the Mobile District's workload for the next few years.

The site occupied a 217-square-mile tract along East Pearl River between Bay St. Louis and Picayune, Mississippi. The test facility consisted of two separate zones. An inner zone, about five miles square, was established where test stands and supporting facilities were constructed. This zone was purchased and owned in fee by the Government. A surrounding buffer zone was established where live stock raising, timbering, and agriculture could be carried on, but from which all structures were removed and in which no persons were permitted to live.

Sverdrup and Parcel of St. Louis, Missouri, was chosen by NASA to provide site criteria and initial planning, and the Corps of Engineers was assigned real estate, engineering, and construction responsibilities. The Mobile District acquired the task by virtue of the site's location within its boundaries. Field survey work was

initiated in December, 1961; land acquisition in January, 1962; and the first construction contract was awarded in October 1962.

The first phase of the survey was a topographical map covering the entire fee area. This project was completed in February 1962. The second phase was a property survey of the area with proper boundary markings. It was completed in August 1962. By that time Real Estate was busy acquiring title to the property. Surveys of the buffer zone progressed, and Real Estate was able to proceed without delay.

Real Estate had to acquire titles to the area before construction could proceed. Fee simple title was acquired to the inner zone. This land was owned by 162 individual owners with the largest being International Paper Company with slightly over 11,000 acres. The remainder of the owners were largely situated in the southwestern corner of the construction area in the Gainesville community. Acquisition was begun with the opening of the Real Estate Project Office in Bay St. Louis on 15 January 1962. In the succeeding months, 90 tracts containing 1,517 acres were acquired either through negotiated settlements or court trial. Two were still unsettled four years later.² This fee simple construction area contained 13,500 acres and was nearly five miles square.

In the buffer zone fee simple title was acquired to 2,615 tracts containing 7,568 acres. Perpetual restrictive easements were imposed over 611 tracts containing 117,874 acres. Condemnation proceedings were necessary in 773 cases. Those proved to have been more difficult and required years of negotiations and court trials to settle.

It was necessary for Real Estate to move two cemeteries and to clear the entire test site area of all structures. While there was no danger to persons living in the buffer zone, the noise and vibrations during test firings would result in complaints, so the solution was to clear the area. In order to do this, one of the oldest communities in

Mississippi, Gainesville, was completely destroyed.

Gainesville was located on East Pearl River and was one of the more important towns in Mississippi before the days of railroads and paved highways. It was the trading center and only point of contact with the outside world for a large section of southern Mississippi due to its excellent harbor on Pearl River. It was a county seat for a while and was a sawmill and turpentine center. When the railroad came through in the late nineteenth century, by-passing Gainesville, the town began to decline. When the Mississippi Test Site was planned, Gainesville was the center of the fee simple zone. Deadline for all persons and property to have been removed was set for 10 January 1963.³ During the final weeks, residents were busy moving out. They emptied their houses, collected their pets and livestock, took up their fences, uprooted their gardens and, in some instances, put their houses on wheeled platforms, and moved out.

During the final days, tourists, newspaper and television crews and the curious kept roads busy. All property not removed by the deadline date became Government property. Property owners found it necessary to stay with their property to the last to prevent pilferage by the curious and the greedy. On 10 January 1963, the community was dead and a way of life had passed for its residents.

Ironically, after the community was dead, the railway arrived. The Southern Railway constructed a branch line from Nicholson, Mississippi, to the Gainesville area which was soon transporting some 60,000 tons of freight monthly.⁴ A sleepy southern community had been transformed into a modern space age scientific complex.

Other communities completely wiped out were Log Town, Napoleon, Santa Rosa, Westonia, Flat Top and Bayou la Croix. In addition, many rural families lost their homes. The Corps of Engineers faced one of its most heart-rending tasks, that of divesting the local people of their homes and

property. Home sites, some of which had been in the same family for over a century, were lost to progress. The task fell to Orrelle B. Moore, who headed the real estate team of the Mobile District Real Estate Division.⁵ Real Estate offices were established at Bay St. Louis and appraisers were sent out to arrive at the value of property in question. Once the property was appraised, negotiators sat down with the owners to try to get them to accept the Government's price. Those negotiators were all Mississippi men and represented the property owners' interests as well as that of the Government. If agreement could not be reached, condemnation was instituted and the land was taken anyway. The Government's cash offer was deposited in the owner's name, who then went to court to try to secure more. Some 70 per cent of the owners representing 96 per cent of the land in the fee simple zone sold their property without contest.

The discontented, led by Dr. J. F. Ferguson, a gentleman farmer in the area, organized a committee of dissident property owners. He sold his 300-acre farm early in the acquisition process, however, and was succeeded as chairman of the committee by Asa McQueen, a country store owner.⁶ This committee corresponded with Congressmen and otherwise sought higher prices for property.

A total of \$19,485,000 was set aside for land acquisition and allied relocations. Because of the court cases about \$500,000 had to be added to that amount. Trials resulted in judgments which averaged more than 50 per cent over the appraised value of the property in contest. Most people, however, if not content to lose their homes, were reasonably satisfied with prices paid for their property. The Corps of Engineers sought to deal equitably with the people and took into consideration sentimental and esthetic values.

NASA, after having taken possession of the property, spared a 75-year-old wisteria vine at Gainesville. It was thought to be one of the largest, if not the largest, in the

world. The main vine trunk was a foot thick and had spread over the ground and 60 or 70 feet to the top of an adjacent cedar tree. The furthestmost extremities were over 100 feet from the base. A protective steel wire fence was erected around the vine and a plaque was placed on the fence stating that the vine was preserved in memory of old Gainesville. Captain William C. Fortune, project manager for the Saturn booster test project, stated further that. "We will disturb the natural beauty of this magnificent country as little as possible."⁷ It is an area noted for its large moss-draped live oaks and cypress trees.

The gardens of Parade Rest, the retirement home of Colonel and Mrs. John A. Wheeler, were also spared. Parade Rest was purchased by Wheeler in 1946 and a home of considerable proportions was constructed. Mrs. Wheeler began developing gardens which finally included over 45 acres and over 5,000 plants including dogwood, wisteria, azaleas and camellias. The home was demolished, but the gardens were preserved. Situated on East Pearl River, at Napoleon, the Wheeler gardens were among the most beautiful in the state. They were opened to visitors.⁸

One of the most laborious tasks of the Mobile District was the removal of 410 graves from the two cemeteries at Gainesville. In 1962 the Corps started gathering data and establishing contact with all known relatives. Some of the graves dated back to the early 1800's. A total of 101 graves were removed from the White Baptist Cemetery to the Palestine Cemetery in Picayune during 1963. The first to have been removed, however, were removed by the Nicholson family of New Orleans to a cemetery there. An additional 141 unclaimed and unknown graves were transferred to the Old Spring Branch Missionary Church cemetery at Napoleon. Those graves had been lost and were rediscovered only by very careful examination of the ground. A number of such graves were also rediscovered in the Black Baptist Church cemetery from which 176 graves were removed. Nothing whatever was found in 175 of the graves moved. Only a razor

or comb was found in some of the others, it having been a practice to bury those items with the owners. Despite the absence of remains, the soil was carefully collected from the center of the graves, placed in plastic bags and reburied in boxes at regulation depth. Religious services were conducted at the re-interment and relatives attended if they desired.

The work was completed during February and March 1964 with Howard Odom of Marianna, Florida, accomplishing the task. The removals were made at Government expense at a cost over \$100,000.

Another problem faced by Real Estate was the purchase of churches and schools. A special problem associated with the purchase of church property was that of cemetery maintenance. Those cemeteries in the buffer zone were not removed since they could still be visited, but church congregations had maintained them. With the congregations dispersed, new solutions had to be found. This problem resulted in court action in some cases, but largely among members of the congregations rather than with the Corps officials.

Several schools also had to be relocated. This created problems, but they were less emotional than the church problems. Relocation involved total disruption of all such institutions since persons associated with them were so widely dispersed. Most relocations progressed relatively smoothly, however.

By the last quarter of 1965, Real Estate Division had just about completed its tasks. In September 1965, the Real Estate office at Bay St. Louis was reduced to only five employees: O. B. Moore, project manager, William Matkin, chief of acquisitions, and three secretaries. One of the most dramatic functions of the Mobile District was drawing to a close and already this land was being transformed into a facility which would play a major role in placing the first man on the moon. A total area of 217 square miles had been acquired for use of the missile testing program. Other Mobile District divisions

were rapidly constructing those facilities.

The selection for the site of the test facility was based upon its accessibility by water. The large booster rockets had to be transported from the assembly site at Michoud to the test site. This still necessitated dredging a harbor and canals to the firing stands. In mid-1963 the dredge *Bean* No. 4 arrived from Harvey, Louisiana, and started circling the 180-acre harbor area at Gainesville.⁹

The harbor was situated about a mile south of Gainesville in a swampy area seldom crossed by man. A cutting crew worked ahead of the dredge, removing the trees. The dredge followed, eating up the stumps and spewing them into a fill area along the banks of the harbor. The dredge worked 24 hours a day seven days a week. Once the 50-foot water path was dredged around the harbor area, the *Bean* was followed by an even larger suction dredge. In a few months one of the most inaccessible and primitive swamps in the South disappeared under 14 feet of water. The railroad connected with the docks and the transformation of the swamp into a transportation facility was complete.

The Saturn boosters proceeded up East Pearl River, entered the harbor by way of a canal, crossed the harbor, were lifted into other canals by means of a lock, and moved on to the firing stands some of which were about seven miles further inland.

Engineering and design for roads, warehouses, utilities, and other more normal type construction were contracted to architect-engineering firms in Mississippi and neighboring states. Special projects such as the central heating plant, the high pressure industrial water facility, and the electronics instrumentation and materials laboratory required the services of design firms with particular experience and capabilities.

The Design Branch of the Engineering Division initiated its work when the first approved criteria for the test complex were received in December 1962. The required

engineering and design capability was found within the Mobile District, the Savannah District, and by utilization of several private architect-engineer firms. A small group of personnel was assigned to Nike-Zeus and NASA projects prior to the Mississippi Test Facility responsibility. They were familiar with NASA work and were acquainted with many of the personalities who were directing the missile testing program. They were, therefore, an ideal nucleus around which to expand for the test facility undertaking.

Construction progressed on a number of facilities within the complex almost from the beginning. There were four test positions in three test stands, one being a dual position facility; test control centers; and data acquisition facilities.

Supporting facilities included an engineering and administrative complex, an industrial complex, a dock and space vehicle storage area, communications facilities, a railroad, and roads and parking areas.

The facility became operational in April 1966. Its initial mission was to test the Apollo-Saturn V second stage booster and to test flight-models of the first and second stage boosters. The first stage was assembled by Boeing Company at Michoud and floated 45 waterway miles to the test site. It had a thrust of 7,500,000 pounds. The second stage was manufactured by North American Aviation, Inc., Seal Beach, California. It had a thrust of 1,000,000 pounds and was also delivered to the site by water.

The Mississippi Test Site remained the test facility for NASA until it was phased out in 1970. An isolated, remote area had been transformed into one of the most complex, sophisticated scientific facilities in the world, performed its task, and was phased out.

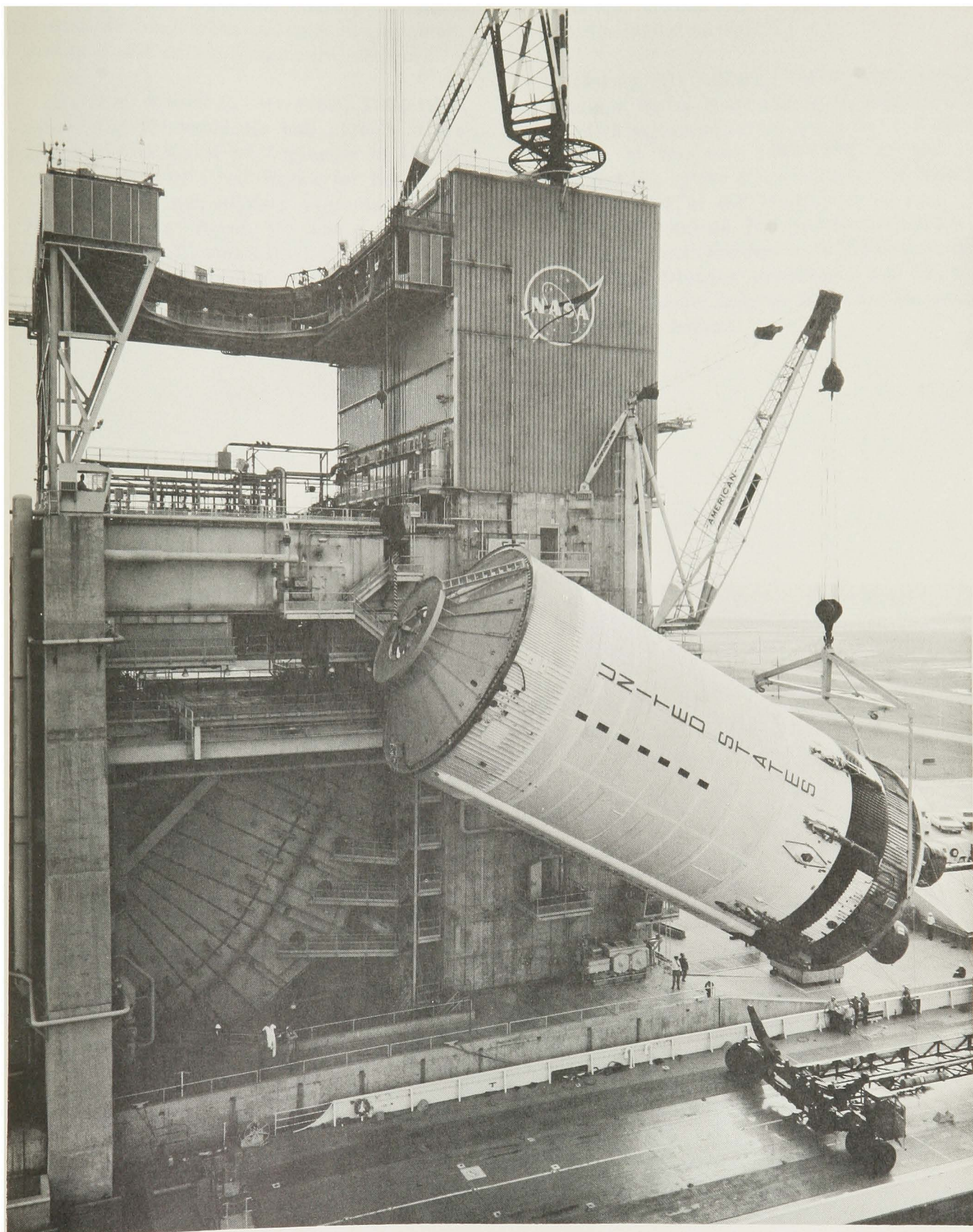
During the later years of the 1950's and early 1960's, the Mobile District participated, through its engineering, design and construction functions, in the development of the Redstone and Jupiter ballistic mis-

siles. It was also vitally associated with the Saturn boosters which landed man on the moon. The Marshall Space Center also gave the Mobile District responsibilities far from home. Because of experience in the missile program, it was assigned central design agent responsibilities for the Nike-Zeus anti-ballistic missile research and development program. In this capacity, the District supervised design of missile and radar test facilities at Ascension Island, Pt. Mugu, California, and at the Pacific Kwajalein Atoll. In addition, a 6000-km diesel power plant constructed at White Sands Missile Range was designed by the District office. These responsibilities were accomplished between 1960 and 1965.

The District also developed criteria for all facilities and supervised the design of the technical facilities associated with project PRESS (Pacific Missile Range Electromagnetic Signature Study), which was constructed in the Kwajalein Atoll. The Honolulu District was responsible for the construction. The Mobile District worked closely with the Honolulu District on the project, and Mobile personnel made frequent visits to Hawaii and to the construction sites. The District, then, was active in the Nike-Zeus and the Nike-X antimissile missile programs as well as the ballistic missile projects, and functioned almost at the other side of the globe.

NASA and Army responsibilities have made Redstone an important missile center. The Mobile District, as its support organization in the area, has been deeply involved, therefore, in the missile program.

When the Mobile District became involved, Colonel Robert W. Love, 1958-1961, was District Engineer. He initiated the Mississippi Test Site Facility, but was replaced by Colonel D. A. Raymond just about the time the project really got under way. Colonel Raymond, 1961-1964, saw the District through the most active period of the project. He also directed the Nike-Zeus project and by the time he was transferred, most of the missile responsibilities had been reduced to routine tasks. Raymond was



**S-II TEST STAND AT NASA MISSISSIPPI TEST FACILITY USED FOR GROUND TESTING
THE SECOND STAGE OF THE SATURN V MOON ROCKET**

assigned to the Pentagon, where he assumed responsibilities in the assignment and career guidance of Corps of Engineers officers.

Colonel Robert C. Marshall, 1964-1967, succeeded Raymond. He had served in the office of the Chief of Engineers as Assistant Director of Civil Works for the Corps of Engineers non-military projects east of the Mississippi River. He was a native of Washington, D.C. and a West Point graduate. He assumed leadership of the Mobile District when it had a backlog of almost \$200 million in construction and engineering

projects; almost 1800 employees and a \$14 million annual payroll.

During his tenure, there were several landings on the moon and much data accumulated. It remained for his successor, Colonel Robert W. Snetzer, 1967-1970, to see the full fruition of the Mobile District's missile support work in the landing of man on the moon. The Mobile District responsibilities were expanded still further in 1970 to include Canaveral District functions, but by that time the missile program had past its zenith for the time being.

CHAPTER XII:

AEROSPACE AGE CIVIL PROJECTS

At the close of World War II, the only river system in the Mobile District to have been improved with permanent facilities, that is, with locks and dams, was the Warrior-Tombigbee Rivers. The Coosa had been improved from Riverdale, Alabama, to Rome, Georgia, by construction of five locks and dams, but that project became inactive during the 1930's and had not been reactivated. Other permanent projects had been authorized by Congress, but because of the demands of war economy had not been accomplished.

The harbors of the District were generally adequate for the use being made of them. Gulfport Harbor had a depth of 26 feet and Biloxi had one of 10 feet. Pascagoula, the site of the shipyards, had a channel 22 feet deep. Mobile Harbor and ship channel was 32 feet deep and Pensacola was 30. Panama City and Port St. Joe each had harbors with 27-foot channels, and Carrabelle Harbor had been dredged to 25 feet. Those channels had contributed greatly to the economy of the area.

There had been a great increase in waterborne transportation. The Federal Government had spent \$14,500,000 on Mobile Harbor and ship channel in over a century of improvements. As an almost direct result of the ship channel, an estimated \$100,000,000 worth of industrial construction was accomplished during World War II. The State of Alabama had spent \$12,000,000 in the erection of the Alabama State Docks during the 1930's. Those facilities were constructed under the direction of General William L. Sibert, retired, of the Corps of Engineers.¹ The total impact on the benefits of the area could hardly be estimated. Commercial value of lands adjoining waterways was greatly enhanced. Transportation savings, national defense, and recreational value are all significant considerations of the impact of Corps projects. As important as the pre-World War II projects had been, they were to be overshadowed by the great multi-purpose dams and the 308 Report ap-

proach to river improvements initiated after the end of the war in 1945.

Even at the height of the war effort, there were some civil projects, but they were primarily those which contributed to the war effort. Those projects had to do largely with widening and deepening channels such as the Intracoastal Waterway already noted. Considerable time and effort had been expended during World War II on plans for a dam at Allatoona on the Etowah River in Georgia. This was a multiple-purpose dam, but the primary consideration was to supply additional electricity at a time when the war effort was making great demands on available supplies. Inability to obtain critical materials resulted in the project being abandoned until after the war.

In 1945, the Mobile District entered a new phase of its history. The nature of the projects necessitated a much more sophisticated approach to civil work. This was the age of construction of the multiple-purpose dams designed to provide electricity, navigation channels, flood control and recreational facilities. Rather than surveys designed to determine requirements to provide channels of a given depth and width, now they took into consideration the entire river basin. Utilization of the entire system to maximum advantage became the goal. While there were civil projects other than river development, the great multiple-purpose dams and the reservoirs created by them were the most spectacular.

This new approach to river development was grounded in the 308 Report approach to river improvement, but was also influenced by the New Dealera projects, which were initiated primarily to create employment during the depression.

The 308 Reports were initiated by an act of Congress, 1927. The title was taken from House Document 308, 69th Congress. This document provided for survey and study of the total watershed of a given river or stream.

It was envisioned that future improvements would take into account the total area and the impact of a given project on it. Several 308 Reports have been completed, but most of the major projects of the Mobile District have been authorized and funded individually rather than as a part of a system.

The New Deal projects really set the tone for future Corps river improvements. The Hoover Dam was initiated before Roosevelt's New Deal, but was completed in 1936 when his New Deal program was at its peak. The Bonneville Dam and the Grand Coulee Dam, completed in 1937 and 1942 respectively, also belong to this era. The most thoroughgoing of all Roosevelt's New Deal projects, however, was the Tennessee Valley Authority created in May 1933. Those programs were a departure from traditional American approaches to problems and were to influence future projects.

Congress responded to the new concepts of the Grand Coulee Dam and T.V.A. projects by passage of the Flood Control Act on 28 August 1937. This Act was amended in 1939 and again in 1941.² The flood control concept was further extended by an act of 1944 which broadened authority to include reservoirs or local protection works such as levees, dikes, or channel improvements, or a combination of the above.³ The concept was extended still further by the Emergency Flood Control Act of 30 June 1948.

Under authorization of the above acts and following the precedent of the Tennessee Valley Authority and other New Deal era projects, the Corps of Engineers entered an era of vastly expanded functions. Rather than projects designed to meet specific localized problems, the Corps initiated programs for long-range coordinated development of water resources of entire river basins. Comprehensive studies have been undertaken which include consideration of navigation, flood control, generation of hydroelectric power, water conservation, domestic and industrial water supply, water quality management and improvement, the protection of fish and wildlife, recreation, and other potential uses of water.⁴

To accomplish the comprehensive studies of the river basins, a new branch was added to the Engineering Division. This was called Basin Planning.⁵ This new branch was formed in July 1963 and accomplished comprehensive reports on the Pearl River and the Pascagoula, Leaf and Chickasawhay River basins. These were a part of the Water Resources Council study and the Basin Planning Branch was formed to accomplish only limited studies. The branch was reduced to a section in March 1970 and transferred to the Environmental and Resource Branch.

The Mobile District maintained the necessary staff to accomplish the design of its civil projects except for some relocated facilities, such as bridges or other structures which were in the reservoir areas. The design of these civil projects, now massive in size and complicated of design, required a far more versatile organization than had existed in the pre-World War II organization. Many technological advances had been made associated with hydraulic structures, the control of concrete mixes and placement of mass concrete, rolled earth fill, structural steel gates and penstocks, and operating machinery. The end result was some of the nation's best engineered dams and most beautiful lakes,⁶

The most impressive river improvement programs are those of the Apalachicola, Chattahoochee and Flint River system. This system has been more thoroughly improved than any other within the District. Improvements provide for navigation, flood control, hydropower and recreation. A channel 9 by 100 feet is provided from Apalachicola, Florida, to the junction of the Chattahoochee and Flint rivers, hence to Columbus, Georgia, on the Chattahoochee River and to Bainbridge, Georgia, on the Flint. Channels of lesser depth are provided to Albany, Georgia, hence to Montezuma, Georgia on the Flint River. The projects have been accomplished as individual works, each based upon its own justifications. They range in size and cost from the magnificent Walter F. George Lock and Dam at Fort Gaines, Georgia, costing \$85,604,754 to the George W. Andrews Lock and

Dam at Columbia, Alabama, costing \$12,962,088. Other projects on the system are the Jim Woodruff Lock and Dam and Reservoir at Chattahoochee, Florida; the West Point Dam and Reservoir at West Point, Georgia (farmed out to the Savannah District); the Spewrell Bluff Dam and Reservoir, and the Lazer Creek Dam and Reservoir, both on the head water of the Flint River. Not all these projects had been started or completed at the time of writing.⁷

One of the lakes within this system, the Buford Reservoir (Lake Sidney Lanier) has been the most visited of all Corps projects in the Nation. Annual attendance has reached almost 11,000,000. This is over twice the attendance at any other reservoir except that of Lake Texoma on the Red River in Oklahoma and Texas. Lake Sidney Lanier is in easy driving distance of Atlanta, Georgia. It is situated in the Piedmont section of the state, and the rolling terrain resulted in a beautiful lake dotted with pine-covered islands. It is well stocked with fish, has 540 miles of shoreline, 68 access areas, 65 public boat launching lanes and 48 picnic areas. There are also 457 tent and trailer spaces, and rental boats are available.⁸

The economic impact on the area has been tremendous in terms of property values; retail sales, especially sporting and recreational goods; and vacation accommodations. The lake has transformed the area into a favorite vacation and recreation spot in a state which has many such facilities, from beautiful mountains to seashore. Careful planning went into the project. Studies made in placing the picnic areas, access roads, and other facilities included joint effort of the Mobile District, the National Park Service, the United States Fish and Wildlife Service and the state of Georgia. This careful planning has paid off in public utilization. While no other project has attracted such widespread attention, Corps projects have produced many lakes within the District, each of which has contributed to the economy and development of the area of its location.

Other river systems which have received much attention are the Alabama-Coosa Rivers of Alabama and Georgia; the Black Warrior and Tombigbee Rivers of Alabama;

and, to a lesser degree, Pearl River in Mississippi and Louisiana. The Alabama-Coosa Rivers improvement program was approved by an act of Congress in 1945, but the individual projects were initiated between 1962-1966 and when completed will provide a 9-foot channel from the mouth of the Alabama River to Montgomery, Alabama. They also accomplish flood control, power, recreation and other purposes in keeping with the 308 Report concept. These projects, along with the Black Warrior and Tombigbee Rivers improvement program, when completed, will give Alabama one of the most complete river improvement and flood control systems in the nation, and will assure the state a major role in the future industrial development of the nation.

Over \$102,000,000 has been spent in replacing the 17 dams and 18 locks of the Black Warrior-Tombigbee system with modern locks and dams. Unlike the Alabama-Coosa projects, this system was concerned with maintaining a 9-foot channel, 200 feet wide, from the mouth of the Tombigbee to the industrial areas in the vicinity of Birmingham. The usual side effects and benefits will be realized, such as flood control, recreation and property value increases. By an act of Congress, 1960, a wildlife refuge of 4,250 acres was created within the reservoir area of the Jackson Lock and Dam (now Coffeetown Lock and Dam).

With the expanded program of river improvement to include flood control, conservation, and otherwise maximum utilization of water resources, the Mobile District has extended its functions into the remote areas of its boundaries. The number of projects are far too numerous to discuss. Sometimes the projects were actually flood control work accomplished by the Mobile District. This type of work often extended to the headwaters of the streams or rivers concerned and included the entire watershed. Only local problems were the objective at other times. The Corps was sometimes concerned with only the accumulation of information, which was made available to state, county or municipal governments for their consideration. In recent years much of this type of work has been accomplished.



WALTER F. GEORGE LOCK AND DAM, CHATTAHOOCHEE RIVER,
ALABAMA AND GEORGIA

An example of this type of study is one recently accomplished at the request of the Gulf Regional Planning Commission presented to the Mobile District through the Mississippi Research and Development Center. The point of concern was flood plain information for the Pascagoula-Gautier, Mississippi area. This area is subject to flooding, especially when hurricanes come inland along the Mississippi Gulf Coast. The study, completed in June 1970, included information concerning past floods and something of what could be expected in the future. This information can now be used in seeking solutions to flooding and in planning the best utilization of land subject to flooding. Such studies have been made for the Elba, Alabama, City Planning Commission; the Atlanta Region Metropolitan Planning Commission; Cedartown, Georgia; and for Lowndes County and Columbus, Mississippi.⁹ There have been others.

While developing the river systems within the District, harbor improvement has not been neglected. As navigation requirements have dictated, channels have been deepened, some as much as 10 feet since World War II. The Mobile harbor and ship channel are the most important in the District, and are the deepest. The final phase of the improvements was initiated in 1963 and was completed in 1965, providing a 40-foot channel through Mobile Bay and a channel through the Outer Bar 42 feet deep. This has guaranteed Mobile a place among the major port cities of the nation.

Lesser harbors have also been improved where needed, either for commercial, military, or recreational purposes. Channels and harbors have also been established and dredged all along the coastal area of the District. Many are used almost exclusively for commercial and recreational fishing and pleasure vessels.

While attention was being given to planning and initiating new civil projects, the Operations Division of the Mobile District continued to receive expanded responsibilities. Each new project usually resulted in permanent responsibility to maintain and operate it. This necessitated organizational

expansion into several branches, Plant, Projects Operations, Permits and Statistics, Hydro Power, and Reservoir, emerged. This meant a great increase in engineers and other technically trained personnel and an increase in floating plant, boatyards, and moorings. The floating plant included dredges, snagboats, derrickboats, towboats, tugs, surveyboats and a variety of work boats, barges, and launches.¹⁰

The snagboat *Ros* was the latest major addition to the floating plant facilities. It was completed in 1969 by the St. Louis Ship Division of Pott Industries and represents the latest in engineering and technological progress. It is 253 feet long, 42 feet wide, and has a displacement of 850 tons. Equipped with the latest equipment, it will perform snag and debris removal from the Alabama-Coosa River systems and commercial traffic lanes through reservoirs from the mouth of the Mobile River to Birmingham and Montgomery, respectively. It will also perform excavation in areas of bank erosion after high-water periods and set stop-logs for lock repairs as the necessity arises. The ever-expanding Operations Division has been headed by T. O. Gaillard for a number of years.

While channels, harbors, and flood control have accounted for the major civil projects, there have been many others. The Mobile District with its vast shoreline on the Gulf of Mexico has carried on a constant battle with shore erosion. In the early history of Corps activity in the area, erosion was a major problem. Forts Pickens, McRee, Morgan, Gaines and Massachusetts have all been threatened by the tides, and erosion destroyed Fort McRee. The others were saved only through major erosion control projects.

This battle to stabilize the beaches has continued. Jetties have been constructed to control the currents such as those at St. Andrews Bay, Panama City, Florida, and at Alabama Point. Seawalls have been constructed at some points. Beaches are still changing, however. The size, shape and location of offshore islands change with each major storm in the Gulf of Mexico. Some of those changes are of no major con-

sequence, but others require attention of the Corps.

The warm climate of the southern Mobile District has created a problem of plants in streams and lakes, especially water hyacinths. Plant control in the waters of the District, like beach erosion, has been a continuing task.

The Mobile District has become deeply involved in real estate. The Real Estate Division, M. W. Dovith, Chief, has continued to expand until it now consists of four branches: Management and Disposal, Planning and Control, Acquisitions, and Appraisals. Major responsibilities are to acquire the real estate needed by the Federal Government for both civil and military projects and to dispose of surplus real estate when Government need ceases. In addition to those responsibilities of long standing, others have been acquired, such as disposing of private homes of persons displaced as a result of shift in governmental functions. A good example was the closing of Brookley Air Force Base in Mobile, which put many homes on the market in a brief period and created real hardships for many owners.

Single projects now cost more than the budget of the entire Corps of Engineers in 1815, when work began in the Mobile District. Such vast expenditures have necessitated great expansion in the office of the Comptroller. That office, headed by Fred Barrineau, consists of the Audit, Budget, Finance and Accounting, and the Management branches. There has been corresponding growth in the size and complexity of the entire Mobile District organization but none to exceed that of engineering.

The Engineering Division, J. J. Danaher, Chief, developed into one of the Nation's most active and sophisticated engineering organizations during the 1950's and 1960's. This was a result, to a large extent, of the geographic location of the Mobile District. The presence of the Marshall Space Center at Huntsville, Alabama, and the selection of Mississippi as the site of the Mississippi Test Facility thrust upon the Mobile District its greatest challenge. The result was an extremely sophisticated engineering division.

In 1964, when the District was at a peak in missile responsibilities, it was no less active in civil projects. The largest contract let at the Mississippi Test Facility that year was to the Koppers Company of New York City for the construction of a dual test stand at a cost of \$17,280,157. The same year a contract for \$18,692,541 was awarded for the construction of the main portion of the Millers Ferry Lock and Dam on the Alabama River in Wilcox County, Alabama. As the Mobile District entered the final quarter of 1964, there were 220 active construction contracts, civil and military, totaling over \$172 million.¹¹

The workload and expenditures of the Mobile District in 1964 were the largest since the peak years of World War II. The Mobile District was the busiest of the 42 Corps districts throughout the world. It is true the missile responsibilities accounted for this, but the important feature of the situation is that civil projects were expanding at the same time. The Mobile District had reached a balance between military and civil responsibilities that gave it a stability dreamed about, but seldom realized, by organizations dependent upon appropriations from Congress.

The Corps spent about \$250 million on the Mississippi Test Facility, but civil projects were under way in 1964 which were to cost over \$300 million. This balance between the civil and military programs and the resulting stability of the workload has enabled the District to develop a well-coordinated, experienced engineering group. Another contributing factor to this stability has been the vast potential for water resources development in the Southeastern United States, particularly within the Mobile District boundaries. Also climatological and physical characteristics have favored the location of military installations in the area.¹²

The various responsibilities accomplished by the Mobile District have resulted in the development of capability sufficient to meet the demands made upon it. This was graphically demonstrated when the District was called upon to meet the crisis created by hurricane Camille.

CHAPTER XIII:

THE MOBILE DISTRICT MEETS CRISIS: HURRICANE CAMILLE

Hurricane Camille struck the Gulf Coast 17-18 August 1969, resulting in mass destruction and the greatest relief and rehabilitation program in the history of the United States up to that time. It also presented the Mobile District with the most serious peacetime challenge of its history. The District was called upon to render services and perform tasks under emergency conditions similar to those created by the World War II and Korean conflict crisis. It afforded an opportunity for the organization to demonstrate its capabilities and effectiveness when called upon to function under pressure.

In spite of warnings and massive evacuation, Camille resulted in the death of 137 persons in Mississippi and 9 in Louisiana, and 27 persons were reported missing. Public property losses were estimated to have been \$210,000,000 and private property at over a billion dollars. This included the destruction of over 5,500 dwellings with damage to many times that number. Over 650 small businesses were destroyed, resulting in loss of employment, business income, and tax revenue. Total destruction was almost beyond comprehension when considered in all its ramifications.

The scope and intensity of the storm exceeded that of any ever to have hit the continental United States. The overall destructive force exceeded that of the tornado which roamed across Missouri, Illinois, and Indiana on 14 March 1925. That storm cut a path about 220 miles long and up to a mile wide. It sped across the landscape at 60 miles per hour. The cloud above it, the *mother cloud*, was so low and the funnel was so wide that it was described as a "turbulent, boiling mass of blackness". It killed 689 people in all, including 234 persons in one community, Murphysboro, Illinois. Destruction would have been much greater had much of the path of the storm not been through rural areas.

Camille hit the populous Louisiana, Mississippi, and Alabama Gulf Coast. Destruction

of life would have numbered in the thousands had it not been for warnings and adequate time to evacuate. It was first detected on 14 August 1969 about 60 miles west of Grand Cayman Island, some 480 miles south of Miami, when only a tropical wave. It developed rapidly and by early morning 15 August, it had reached hurricane intensity. By that afternoon the winds had reached a velocity of 115 miles per hour. It was moving in a northwesterly direction 6 to 7 miles per hour. The trek across Cuba weakened the hurricane only slightly and once over the open Gulf of Mexico it began gaining strength. Its forward movement increased to about 10 miles per hour. Early on 16 August, a hurricane watch was posted from Biloxi, Mississippi, to St. Marks, Florida. Hurricane warnings were issued for the Florida coast from St. Marks to Fort Walton.

The movement of the storm slowed in the afternoon of 16 August, but the velocity increased. A reconnaissance aircraft indicated that maximum winds were an estimated 150 miles per hour near the center, which was located 380 miles south of Fort Walton, Florida. Hurricane warnings were issued from Fort Walton to Biloxi, Mississippi. Early next morning the storm was about 250 miles south of Mobile, Alabama, and was moving north-northwesterly at 12 miles per hour. Winds near the center were 160 miles per hour. By late afternoon they reached 190 miles per hour.

The hurricane moved inland at the Waveland-Bay Saint Louis, Mississippi, area near midnight 17-18 August with gusts of wind estimated at up to near 200 miles per hour near the center.¹ Gusts up to 75 miles per hour extended eastward along the coast to Mobile Bay and inland to just south of Jackson, Mississippi. The eye of the storm at landfall was about 12 miles diameter and crossed directly over the town of Waveland, Mississippi, at a speed of 15 miles per hour. The tidal surge reached an unprecedented height of 22.6 feet above mean sea level at

Pass Christian and was 6 feet as far east as Gulf Shores, Alabama.

The eye of the storm moved across Mississippi, passing within a few miles of Columbia. The maximum recorded wind speed there occurred at 2:55 a.m. (C.D.T.) on 18 August and reached 120 miles per hour with gusts up to 135 miles per hour. The wind instrument tower collapsed at that time, so no official record exists thereafter. An observer described the storm's fury. Limbs were breaking from trees, large trees were falling, and the streets were covered with debris, many being blocked by fallen trees.²

Destruction in the path of the center of the storm at landfall was virtually complete. The hurricane winds (speeds greater than 75 miles per hour) extended from New Orleans to Pascagoula. Extensive damage occurred from New Orleans to Pascagoula with less serious destruction extending into West Florida and as far inland as Jackson, Mississippi.

The Mobile District Corps of Engineers began to take official action concerning Camille as early as 14 August 1969. When the U.S. Weather Bureau advisory No. 1 was received, close observation of the path of the storm and its potential to develop into a hurricane was commenced. The path of the storm was plotted and its rate of progress computed. Phase I of the Mobile District hurricane plan was initiated. All floating plant were notified and work schedules reviewed. Protective plans and emergency equipment were rechecked for readiness and reliability and all contractors engaged in work for the Corps of Engineers were informed of the direction and potential of the storm.³

Advisories issued on 16 August indicated that Camille would probably go inland somewhere in the Mobile District. Phases II required that constant communication between the District and the area offices be maintained. This was accomplished by means of the District's radio net, which enabled the District, Area Offices, and floating plants to keep in constant touch. All inactive floating plant was moved to pre-selected mooring

areas for safety and standby watches were set up. Emergency power supplies were checked to assure proper operation if needed.

Phase II was initiated by ordering all Government-owned floating plant and appurtenant equipment be moved to safe harbors. All contractor-owned equipment was released to seek refuge from the storm. On 17 August a 24-hour watch was established for certain designed elements in the District office and in the coastal area offices. By noon of the 17, all floating plant and equipment had been safely moored. Plans were drafted to have teams move into the storm area after the storm moved inland.

An emergency operations center was established at 7:00 A.M. (C.D.T.) 18 August after the storm center passed landfall from which eleven survey teams were dispatched. They were instructed to inspect the damaged areas and report on damages and needs for assistance. An inspection and photographic mission was also made by helicopter. The survey revealed that there had been little damage east of Mobile, but destruction became progressively worse west of Mobile to Waveland, Mississippi. The ground survey teams could hardly move around because of obstructing debris in every highway, street, and waterway. The helicopter survey team got the first view of the massive nature of the destruction.

Beginning at Pascagoula, much beach front property had been destroyed. It became progressively worse and from Gulfport to the Louisiana line, one could travel west along Highway 90 for several miles and not find one house left standing. The beach front for about two blocks inland had been swept almost completely clean of all buildings. The eastbound lane of Highway 90 was destroyed for long strips in many places. Massive concrete deck slabs of bridges had been displaced. In some instances they were lifted and deposited on the edges of the slabs of the opposite lane. Tracks and ties were washed from the railroad bridge over St. Louis Bay, and tracks and bridges were damaged or destroyed in many other locations. Harbors, port facilities and break-water structures were destroyed or heavily

damaged. The merchant vessels, *The Hulda*, *Silver Hawk*, and *Alamo Victory*, were grounded at Gulfport, and a large barge was beached on Highway 90. All communication facilities were out and all utilities destroyed over the area. The loss of life would have been staggering had it not been for a massive and successful evacuation effort.

By the time Camille reached landfall, evacuation of the lower portions of Plaquemine and St. Bernard Parishes in Louisiana was almost 100 per cent complete. The beach front area of Mississippi and Alabama was over 90 per cent evacuated. Residents of low-lying and exposed areas sought refuge in about 263 shelters in 25 counties and parishes in Alabama, Mississippi, and Louisiana. Many others sought protection with friends and relatives who lived inland. Still others moved to commercial lodging in protected areas. An estimated 200,000 persons sought refuge from Camille. What could have happened to many of those evacuees is grimly portrayed by the experience of the Richelieu Apartments party at Pass Christian. There 23 persons refused to leave, preferring rather to sit the storm out. The apartment complex was completely destroyed and only 3 of the party survived. Modern communications making warnings adequate and modern transportation facilities making evacuation possible saved scores of lives.

Before noon of the morning following the storm, many agencies and volunteer groups were entering the distressed area to aid the thousands whose homes had been destroyed or damaged. Those were expanded until over 25 Federal agencies were included, with several organizations within some of those agencies participating. The Department of Defense is a good example. Organizations from that department included the Army, Air Force, and the Navy and Marine Corps. In addition, the American Red Cross and many other public and private bodies assisted. Only the work of the U. S. Army Corps of Engineers is included in this presentation.

The Mobile District became involved in the recovery program first under the Corps' continuing statutory authorities, and then at

the request of the Office of Emergency Preparedness. The Corps had extensive authorities under which rehabilitation work was accomplished under Public Law 99, 84th Congress, and Section 3 of the River and Harbor Act of 1945. There were also various project authorizations under which regular operation and maintenance work was carried out. The Office of Emergency Preparedness (OEP) requested Corps assistance under Public Law 875, 81st Congress, which authorizes Federal assistance to states and local governments in major disasters. Later authority was expanded under Public Law 79, 91st Congress, passed six weeks after Hurricane Camille. This law authorized emergency relief to private citizens who suffered losses from the storm.⁴

Commitments under continuing Corps authorities called for the restoration of all Federal navigation projects to pre-hurricane conditions, repair of the Harrison County, Mississippi, seawall, and various surveys and inspections. This included restoration of all the coastal project channels which had been damaged. All those from Perdido Pass near the Alabama-Florida line to Pearl River, Louisiana, were heavily shoaled and clogged with debris. There were many wrecks which obstructed the channels. This was a monumental task within itself, and ultimately resulted in a \$4,000,000 expenditure. It was completely overshadowed, however, by the recovery assignments from OEP.

The first task was an evaluation of damages. Survey teams covered the affected territory within the Mobile District, making comprehensive studies of the flooded areas. Effort was made to determine all damage sustained by both real and personal property and economic losses to commercial and industrial concerns. Then effort was made to evaluate the cost of relief and rehabilitation. It was difficult to determine damages in many instances, since nothing was left upon which to base estimates. Often all that remained was a vacant lot with even traces of foundations vague or gone completely. Tax assessors records were utilized when practicable, but they often did not reflect fair market value. Street to street surveys were made in the flooded area, and every effort

was made to arrive at value of property damaged or lost.

The survey revealed that the destruction was almost complete for some three or four blocks inland along the entire 75-mile Mississippi Gulf Coast. Residences, motels, apartments, restaurants, and other structures were reduced to rubble and swept into great heaps of scrap lumber and masonry along with fallen trees, ruined automobiles, and grounded boats. Over 3,800 homes were completely swept away along this strip and 16,000 suffered severe damage. In low areas residential sections were flooded as much as 15 feet deep.

The total effect was dramatic and eerie. At a season when the Gulf Coast is normally green and lush, trees had been stripped of all leaves. Most small terminal twigs had been stripped as well and many large branches were broken. Many large trees, especially pines, were broken many feet above the ground and looked as if they had been twisted by some giant hand. Some trees were even stripped of their bark. Replacing the foliage in the trees were bits of clothing, spreads, sheets, and other household items deposited there by wind and flood. Streets were completely impassable.

Before any significant rehabilitation could be accomplished, it was necessary to clear the streets and utility rights-of-way and restore power, water, sewage and communication systems. Three requests were received from OEP 19 August, 22 August and 17 September, accompanied by outlines for technical services and field operations to be performed by the Mobile District under Public Law 875. In addition to surveys and assessment of damages as already noted, debris was to be cleared and removed from all non-Federal public roads, streets and other essential public property. Debris was also to be cleared from private property and non-essential public property and other works performed when certified by the state and U. S. Public Health authorities to be essential to public health and safety.

The order came from OEP by telephone on Tuesday, 19 August, after President Nixon had declared the storm area a major disaster area. Twenty-six counties in Mississippi and

one in Florida and Alabama each fell within the Mobile District. A letter confirmed the order later. Colonel Robert E. Snetzer, Mobile District Engineer, called a meeting of his key personnel and outlined the task before them. When Colonel Snetzer ordered that contracts be in effect and operative within a few hours, it appeared impossible.

Contracts were normally advertised for 30 days. Civil works projects usually were advertised for 45-60 days. Supply let out the advertisements. Bids were received and opened and construction recommended awards. Recommendations were referred back to Supply normally in 1 to 4 days. If there were no difficulties, contracts could be let in 5 to 6 weeks. Now the Corps was called upon to let contracts within hours. Though the task seemed impossible, Colonel Snetzer was firm and ordered that his staff proceed.

Calls had come in to the Mobile office on Monday from persons having equipment and desiring to assist in the cleanup. Some of those had had experience in hurricane cleanup, especially after Hurricane Betsy in 1965. Within 48 hours after Camille struck, five contracts were in effect. They were cleaning streets and rights-of-way. Many contracts were negotiated within a day and work continued seven days a week. The contracts included removal of debris from much private property since such property was declared a health hazard by either the United States Health Department or State Health Departments. In some areas it included almost all private property. There were dead animals and inflammable materials to be removed and debris which obstructed repairs to sewage systems.⁵

The Mobile District was authorized to repair or replace damaged public buildings, utilities, and other eligible facilities when requested by local officials. Also an inspection team was given the responsibility for inspecting and documenting eligible rehabilitation work that government entities preferred to perform themselves subject to reimbursement. The Corps was further authorized to give technical and administrative assistance to government entities desiring Federal assistance and reimbursement to them for emergency expenditures.

EMERGENCY CLEANUP OF MISSISSIPPI COAST FOLLOWING HURRICANE CAMILLE



RAVAGED AREA IN GULFPORT AFTER WRECKAGE PUSHED ASIDE FOR ACCESS
TO HOMES AND UTILITY INSTALLATIONS BUT BEFORE REMOVAL OF DEBRIS



CLEARING PRIVATE PROPERTY OF
SAFETY AND HEALTH HAZARDS



CLEARING STREAM OF DEBRIS

The Corps' role in providing technical and administrative assistance and direct financial reimbursements to local entities was a departure from the usual OEP procedures. Local governments did not have the resources or knowhow to cope with a disaster of such magnitude. Normally the State of Mississippi would have handled such responsibilities and made the payments, but the task was too great.

Within 10 days the Mobile District had restored freedom of movement on 586 miles of highways and streets. By mid-November about 1.25 million tons of debris had been removed. By that time, that phase of the operation was virtually complete. Contracts had been negotiated for set fees for a piece of equipment and necessary operators for pushing and removing the debris. The Real Estate Division was responsible for securing disposal and land-fill areas. Contracts awarded by the Corps required that available local labor be hired and included the nondiscrimination clause.⁶

Many homes had to be moved from streets and highways. In many cases, the Corps' contractors returned the homes to their foundations, and in doing so, rendered assistance to stricken homeowners. Homes were thus restored for 81 homeowners in Mississippi alone. Services went much further for the town of Pass Christian. At the request of the OEP, the Mobile District assumed full responsibility for restoring all public services. This included utilities, providing a fire truck, police cars, and a temporary city hall.⁷

To meet the crisis, the Mobile District gave priority to the recovery task over all its normal responsibilities. It also called upon other Corps organizations for assistance. A total of 137 civilians and 14 officers from districts and divisions as far away as Portland, Tulsa, and Chicago came to the aid of the Mobile District, and the District Engineer was given command of other military organizations engaged in debris removal. Among those were about 800 Seabees stationed at Gulfport. An Engineer Construction Battalion and a reinforced company from another Engineer Battalion numbering about 900 men were dispatched from Fort Benning, Georgia.

The District Engineer was also responsible for letting contracts and seeing that the terms of such were met. The capability of the Corps increased rapidly. Within a few days there was a tremendous concentration of dump trucks, loaders, dozers, cranes, and other equipment employed in the project. The forces under contract peaked at over 3,000 men.

Most of the contracts progressed smoothly and without incident. It was noted by Corps officials that some trucks delivering debris to disposal areas were arriving with much less than normal loads. Since pay was based on loads hauled, the Corps was paying for more than it was receiving. It became necessary to place inspectors at the disposal areas temporarily.⁸ Colonel Snetzer was directing a vast and complex operation.

Within 10 days after the storm, 586 miles of streets and highways had been cleared. Soon this accomplishment was expanded until 2,400 miles of streets and roads had been cleared and a total of 313,300 tons of debris had been removed. This opening of roads and streets was accomplished by Corps contractors and military units. At first the debris was simply pushed aside to whatever location was available. Once the streets and roads were open, disposal locations were secured and the debris removed.

Particular problems presented themselves which required specialized personnel. Military units under Corps directions disposed of hundreds of dead animals and tons of spoiled fish, shrimp, and food. It was also necessary to dispose of a large stockpile of spoiled fish meal. With all electricity out, all refrigerated foods spoiled and presented problems of disposal unlike that of most debris. Another particular problem was that of traffic. With so few traffic arteries open for the first few days after the storm, problems developed at critical crossings during debris removal as residents began to return and sightseers flooded the area. Contracts were negotiated with the sheriffs of Hancock and Harrison Counties, Mississippi, for additional deputies for traffic control. Other types of specialized contracts included those for demolishing large buildings left standing but structurally unsound, and those for replacing buildings

to their foundations where they had been swept away by the tide water.⁹

By December 1969, work under Public Law 875 had been almost completed. A few small Federal contracts at Pass Christian still required supervision, and a number of city and county contracts for OEP reimbursement had to be monitored. The Mobile District was already anticipating responsibilities under Public Law 79 and was becoming organized to assume this new task though orders to do so were not received until 20 February 1970.

Just about the time Public Law 79 was implemented, a new responsibility was assumed under Public Law 875. The Office of Emergency Preparedness determined that the removal of debris from public-owned navigable waters other than Federally authorized projects was eligible under that law. Public Law 79 had initiated a whole new realm of Federal services, that of cleaning up private property, including private waters. OEP concluded that the cleanup of public waterways more logically belonged under Public Law 875, so additional work was accomplished under that law.

Six snagging contracts and one dredging contract were negotiated. The debris was removed from the waters and deposited at stockpile areas. Clearing contractors working under Public Law 79 removed the material to dumping areas.¹⁰

By mid-January 1970, Colonel Snetzer was notified officially that the Mobile District would be responsible for services under Public Law 79. It was necessary for those seeking assistance to apply through a plan established by the state. Mississippi finalized its plan and started receiving applications on 19 January. By the end of January, the District office had assessed its responsibilities and developed a plan to accomplish them. Authorization was given by OEP 20 February, and the Corps was ready to implement its program.

The Corps was given responsibility for cleaning up private property in urban areas, and all work in agricultural and undeveloped areas was assigned to the Agricultural Stabilization & Conservation Service (ASCS). The Corps, under this arrangement, received

over 80 per cent of the applications. Those applications included reimbursement for work done by the applicant, debris removed by the Corps, a combination of reimbursement and debris removal, and applications for the demolition of structures.¹¹

By 1 March, the Engineering Branch at the Gulfport area office had 60 engineers and engineer technicians functioning. They developed location maps for debris removal and determined eligibility of structures on demolition applications. Over 700 structures were demolished either by equipment rental contractors, or under lump-sum contracts. About 9,000 claims for reimbursement were processed and over \$2,610,000 was paid to individuals who had paid for removal of debris themselves. Over 15,000 applications for removal of debris by the Mobile District were approved.¹² The Corps cleared about 14,300 residential lots and 280 wooded tracts under Public Law 79. About 1,500,000 tons of debris were removed.

By October 1970 the work was virtually complete. Recovery operations following Camille were by far the largest task of its kind ever undertaken by the Mobile District. For the next year after the storm struck, a major portion of the resources of the District, manpower, equipment, and funds, were diverted from normal use to be used to rehabilitate the disaster area. There was considerable curtailment of the civil works engineering program, and a slowdown in routine maintenance of navigation projects. Improvements at reservoir projects had to be delayed.

The adverse effect of Camille on the District's operation was greatly diminished because the storm came at a time when the construction workload was declining. The President announced a 75 per cent cutback in contract awards in September 1969, just after Camille. This resulted in a reduced workload throughout the Corps of Engineers. The Camille assignment precluded the need for a reduction in force in the Mobile District and made it possible to secure aid from many other Corps Divisions and Districts.¹³

Colonel Snetzer was given overall com-

mand of 1,700 uniformed personnel and several thousand civilian contractors and civil service personnel. The work forces under his command operating under Public Laws 875 and 79 were far more than the normal forces under his direction as District Engineer. He was ably assisted by Lieutenant Colonel Paul D. Sontag as Deputy District Engineer of the Mobile District. Together they directed expenditures of over \$49,000,000 in recovery and rehabilitation services.

They were served by career Corps personnel of the Mobile District, who devoted many hours to arduous tasks which demanded much more of them than their normal Corps functions. Many key persons were assigned to temporary duty at one of the nine field offices maintained within the disaster area. Some of those spent many months away from home, serving until the emergency was over.

The effectiveness of the Corps' accomplishments is reflected in the fact that of the thousands of applications for reim-

bursement processed, there were only 180 appeals. This amounted to only about two per cent of the total claims. This is even more amazing when it is considered that Camille was the initial test for Public Law 79, and the Corps was functioning without experience or precedence in the matter. Colonel Snetzer's accomplishments did not go unnoticed. He was personally commended by President Nixon and was awarded the Legion of Merit for his leadership during the early phases of Hurricane Camille recovery and rehabilitation work.

The nature of disasters is such that people are not prepared to meet them in most instances. Since the precise time, place, and nature cannot be anticipated, adequate preparations can seldom be made. Each will require its own unique responses. It is evident, however, that the Mobile District was capable of mobilizing and directing vast resources in a most commendable fashion, thus relieving much suffering, inconvenience and economic loss.

CHAPTER XIV:

LOOKING INTO THE FUTURE

As the Mobile District entered the 1970's, it continued extensive civil projects already projected and under construction. The Corps was engaged in many projects in various stages of completion. Any cutoff date would leave many works incomplete and many questions unanswered. Mid-1971 has been chosen for the cutoff date for this research. Three considerations were prominent as the Corps entered the new decade; the Tennessee-Tombigbee Waterway, ecology; and manpower economy. The outcome of none of those considerations could be determined absolutely at that date.

The Tennessee-Tombigbee Waterway was authorized by an act of Congress in 1946. Construction was scheduled to begin in 1971, twenty-five years later. It was without doubt the oldest project of the Corps of Engineers in terms of the inception of the idea and it was the largest civil project of the Mobile District. It has been deeply involved in national and sectional politics. For those reasons, more attention has been devoted to it than might be otherwise.

W. A. Evans, a Mississippi historian, has asserted that French settlers as early as the eighteenth century considered advantages to be realized by connecting the Tennessee and Tombigbee Rivers. The Marquis de Montcalm advised Louis XV of France that such a canal was needed about 1760.¹ This interest in river improvement was in keeping with accomplishments at home, France having been the first nation of the western civilization to have developed a national transportation system.

The next recorded interest in the waterway was a petition submitted to Congress in 1810 by a group of citizens of Knoxville, Tennessee, requesting such a project.² The first indication of Corps official interest appears in the report of Simon Bernard, member of the Board of Engineers, in 1817. Bernard surveyed future prospects of the Alabama and Tombigbee River Valleys and concluded that those valleys must be afforded adequate defense for "that fine

country . . . assuring its inhabitants the peaceful enjoyment of all prosperity which they will be blessed with: if particularly we consider that it is destined to become the natural communication between the valley of the Mississippi, Tennessee, and the Sea," by means of an artificial canal.³

The Corps of Engineers was primarily interested in military projects at this time. It was generally assumed that river improvements would be accomplished by the states. Shortly after Alabama entered the Union in 1819, the state hired an engineer to survey Alabama's rivers with the hope of connecting them with the Tennessee. Tennessee was also investigating the possibility of connecting the Tennessee with one of the Alabama rivers, possibly the Coosa.⁴

Alabama and Tennessee were not alone in their ambition to open a waterway from the Tennessee to open water. Georgia had high hopes of making Savannah a major port by capturing the commerce of the interior. In 1825 a Board of Public Works was created by the Georgia State government whose duty it was to employ "artists, agents, and laborers" to make surveys and estimates for canals, roads, and bridges. The board was given specific instructions to investigate the possibility of constructing a canal across the state as centrally located as possible, to join the Tennessee River. It was hoped that a main canal could be built with subsidiary canals connecting the rivers of the state. Hamilton Fulton, an Englishman, was appointed chief engineer. He divided the state into three sections and employed crews to work on each. The northern division, with primary responsibility for plans for the canal was assigned to Wilson Lumpkin.

Lumpkin surveyed a route for the canal, and it was considered possible and practical to construct such a waterway. By the end of 1826, however, the board had been discredited and was abolished. The canal was never constructed but the state did build the state-owned Western and Atlantic Railroad along

the route surveyed by Lumpkin. It was built between 1839 and 1851 from Chattanooga to a southern terminus on the Chattahoochee where it connected with other lines. At this terminus, the great industrial city, Atlanta, developed.⁵

It was fifty years later before further thought was given to the waterway. After the Civil War, President Grant concluded that flooding of the lower Mississippi River could be controlled by diverting waters of the Tennessee River to the Gulf of Mexico. There was no merit to the argument, but the Corps of Engineers did make a serious investigation of the possibilities for such a project for commercial purposes in 1874-1875. It was concluded that the canal could be built, but the Corps doubted that there was enough commerce in the area to justify it.⁶

Corps studies made in 1913, 1923, and 1932 resulted in conclusions that the cost of constructing the waterway would exceed benefits derived from the project. It would not be justified therefore.⁷ After 1932 favorable reports were given by the Mobile District. The survey upon which authorization was made was completed in 1938 and submitted to Congress in 1939. Authorization came some years later. While this may not be true with regard to other projects, the Corps became interested in the Tennessee-Tombigbee Waterway after it had received considerable political attention.

Politics on the state level have been most active in Alabama. There was support for a connection by way of the Warrior River in addition to, if not instead of, the Tombigbee. This route would place the entire project within the state of Alabama. The connection with the Tombigbee would place much of the route in Mississippi with most of the major construction projects in that state. The conflict between the rival interest was intense in the late 1930's.

In 1945 the Corps of Engineers made its final examination of the project prior to authorization for construction. This examination was an elaboration of the survey made in 1938 which had resulted in favorable reports from the Corps. The project as present-

ed to Congress would create a slack water route from its junction with the Tennessee River to the Gulf of Mexico by way of the Port of Mobile. It would entail improving 170 miles of existing river channel, constructing 45 miles of canal and building five dams and ten locks across the dividing ridge between the Tennessee and Tombigbee watersheds, the ridge cut alone being 27 miles. The ridge cut was projected for the Nashville District while the Mobile District would accomplish the rest. These plans were to be modified with the passing of years between authorization and the appropriation of funds for construction.⁸

When the Corps completed its examination and presented it to Congress, both houses of the Alabama Legislature unanimously adopted a resolution in support of the project.⁹ While Alabama was now on record supporting the Tennessee-Tombigbee route, the question of a possible Tennessee-Warrior route would be warmly discussed in 1959-1960, both by Mobile District officials and interested persons in political circles in Alabama.

Congress accepted the recommendation of the Corps of Engineers and authorized the Tennessee-Tombigbee Waterway 24 July 1946.¹⁰ This came only after years of political campaigning for Congressional approval. The House rejected authorization in 1939, and the Senate in 1940.¹¹ Senator Arthur Vandenberg of Michigan led the opposition to authorization. He pointed out that the Corps of Engineers had reported unfavorably on the project in its previous reports, and now the reversal of its position was only a feeble one. Support for the waterway was led by Senator Theodore G. Bilbo of Mississippi, but when the vote was taken, the proposal was defeated.

The project was debated in the House Rivers and Harbors Committee in March 1941. Among those appearing before the committee were Major General Julian L. Schley, Chief of Engineers, and Tom Faust of Mississippi, lobbying for the railroads. Schley would go no further than to say that the project was practicable both from an engineering and economic position. He did not come out specifically for the project at

that time. Faust, on the other hand, insisted that the project would cost Mississippi money because of the requirement that a portion of the cost would have to be absorbed locally. Mississippi, he said, would not support a project which it could ill afford to support financially.¹² This time the committee reported favorably. Its recommendation included \$66,000,000 for the project, but because of the war crisis, no river and harbor bill was passed in 1941.

The committee reported favorably on the project again in 1943, and it was included in the omnibus river and harbor bill which included 271 projects. When the bill was debated on the House floor, Republican opposition, which had opposed the project in committee, now fought it on the floor. Representative Dondero of Michigan offered an amendment to strike the southern waterway from the bill. The amendment carried, and the project was stricken from the omnibus river and harbor bill. The opposition vote was largely Republican 148 Republicans to 45 Democrats voting against the waterway.¹³

Because of inflation and other factors, the cost had increased from the initial \$66,000,000 estimated to a projected \$386,570,000. The project was 253 miles long including 168 miles of improved river channel, 45 miles of canal and a 27-mile cut through a ridge separating the Tennessee and Tombigbee Rivers.

This waterway would provide a slack-water barge route which would give 23 states outlet to open water by way of the Port of Mobile. The water route to the Gulf of Mexico would be shortened as much as 700 miles from some points now using the Mississippi River. The Corps of Engineers estimated that the project would return \$1.66 for every dollar spent. It was anticipated that it would result in an industrial boom along the waterway, and would tremendously increase the importance of the Port of Mobile in National and international commerce.

The project was obviously deeply involved in sectional politics, and what happened to it was out of the hands of the Corps of Engineers. The *Tuscaloosa News*

saw the rejection of the waterway as indication of the lack of political bargaining power of the "Solid South".¹⁴ The Tennessee-Tombigbee project was excluded from the river and harbor bill completely in 1945. In an attempt to present the bill free of all controversial projects, Senator Overton, chairman of the Rivers and Harbors Subcommittee of the Senate Commerce Committee, excluded all those projects which had not been clearly and firmly approved by the Chief of Engineers. There were 291 projects included in the bill, and the Tennessee-Tombigbee Waterway was the first project listed among those which had been eliminated.¹⁵ The problem with the project at this stage was sectional politics and this problem was destined to delay the development of the waterway for the next 25 years.

Finally the Tennessee-Tombigbee won approval in the 1946 river and harbor bill. The bill authorized projects costing \$600,000,000 - this project alone accounted for \$116,941,000. The 1946 Congressional sessions were stormy with sectional politics. By this time the Deep South congressmen were much more united in support of the project, and the border states were stronger in their support. The opposition, on the other hand, was more outspoken. Clare Hoffman, Republican Representative from Michigan, charged that the "tax-paying states" of the East, the North, and the central states should not be burdened with millions of dollars in appropriations for strictly local improvements in the South.¹⁶

The opposition lost, however, and the House of Representatives voted 184 to 164 to authorize the waterway. Attempts to strike the project from the river and harbor bill failed in the Senate by a vote of 21 to 44.¹⁷ Authorization was made after some 200 years from the first inception of the idea for such a project by the French, but no appropriation accompanied the authorization. Representative John E. Rankin of Mississippi spoke in behalf of an appropriation in 1947 and many times between 1947 and 1951, but his influence probably caused more opposition than support. In 1949 an appropriation of \$200,000 for planning was approved though one of \$2,500,000 proposed for construction



PRESIDENT RICHARD M. NIXON WITH DIGNITARIES AFTER UNVEILING PLAQUE
COMMEMORATING EXPECTED START OF CONSTRUCTION ON THE TENNESSEE-
TOMBIGBEE WATERWAY, MOBILE, ALABAMA, MAY 26, 1971

was defeated. At last planning could be initiated.

Failing to get further consideration from Congress, Mississippi and Alabama entered into negotiations which ultimately secured sufficient political support to secure appropriations. Colonel Harry Griffith, District Engineer, Mobile District, announced 10 April 1971 that the first bid for construction of the first project of the waterway would be opened in June 1971. This first construction project was a lock in a canal across an oxbow bend in the Tombigbee River near Gainesville, Alabama. This project was estimated to cost about \$10,000,000.¹⁸

The 1970 appropriation bill included \$1,000,000 to begin construction. President Nixon froze the funds and they were not released until the spring of 1971. The proposed 1971-1972 budget included \$6,000,000 for the waterway. From this initial construction project it was anticipated that progress would be consistent until completion of the project in about ten years. The climate of uncertainty which had surrounded the project during attempts to get it approved and funded was dispelled 26 May 1971 when President Nixon visited Mobile and dedicated a plaque commemorating the beginning of construction. Serious opposition mobilized, however, and additional delays were experienced. Though Republicans had consistently opposed the waterway, it finally was funded under a Republican president and a Republican representative, Jack Edwards, of Mobile, who was one of its strongest advocates.

In his dedicatory speech, Nixon said, "We're not Northerners, Easterners, or Westerners". He appealed to Americans to unite and stated that the five states working together with the Federal Government to build the waterway link between mid-America and the Gulf of Mexico demonstrated the benefits of cooperation.¹⁹ There was every reason to believe that the project would receive adequate administrative support to progress without further interruption.

Construction of the first phase of the Tennessee-Tombigbee Waterway could not begin until an environmental study was com-

pleted and presented to the Council on Environmental Quality. The Corps had to be able to state that the construction of the waterway would not result in adverse ecological or environmental effects as required by the National Environmental Policy Act of 1969. Ecologists delayed the beginning of construction beyond the date of writing. Environmental quality control was the second primary consideration as the Corps faced the decade of the 1970's.

The U. S. Army Corps of Engineers has been given credit for much of the pollution and ecological crisis which faces the nation. If one took seriously the charges of Justice William O. Douglas and other outspoken opponents of the Corps, he would conclude the Corps of Engineers is responsible for most of our national ills in those areas.²⁰

Opposition to the Corps of Engineers was only one aspect of a movement reflecting great concern with ecology. The movement resulted in the Environmental Policy Act of 1969 and in determination to enforce the Refuse Act of 1899, which requires that all industries get approval of the Corps of Engineers before dumping refuse into streams, rivers, lakes and bays.

To meet the requirements of the Environmental Policy Act, the Institute of Water Resources, Corps of Engineers, issued environmental guidelines in November 1970.²¹

The Mobile District began to feel the impact of the demands of the environmental guidelines in late 1970. Those guidelines were met as rapidly as funding permitted. The responsibility was shared by areas involved in planning, design, construction and operations. Each of these areas followed guidelines which were now Corps policy as they approached their responsibilities.

By 1971 the Mobile District was applying the guidelines to all projects as funds were made available.²² The area which had felt the impact greatest was probably the Operations Division. T. O. Gaillard, Chief, Operations, was responsible for carrying out the provisions of the Refuse

Act of 1899. This meant the application of guidelines to numerous private industries which must develop new systems for the disposal of refuse. Practice of long standing had to be abandoned. Operations was responsible not just for inspection of new industries as they are built, but also those already operating. The task was staggering.

The Refuse Act of 3 March 1899 (33 U.S.C. 407) had not been seriously enforced until recently. The Operations Division of the Corps of Engineers, Mobile District, became responsible for issuing permits to all who discharged or deposited refuse into navigable waters of the District or into any tributary of any navigable water from which the refuse would float or be washed into such navigable waters. Any firm wishing to discharge such refuse had to get a certificate from the state which verified that such refuse did not damage the water beyond standards established by the state. The Mobile District issued no permits until such a certificate was secured from the state. Thus far the standards set by the states within the Mobile District have been acceptable to the Corps of Engineers.

It was the responsibility of the Corps to see that such standards were kept up to par and that they were met by any persons, firms, or others who discharged refuse in the waters. Regulations as they existed at the time of writing stated that all facilities which existed but were not in existence or lawfully under construction prior to 3 April 1970 must apply for permits as soon as possible following the publication of those regulations in the Federal Register, but in no event later than 1 July 1971. Operations secured permit forms and set up the necessary facilities for processing them. The initial forms proved less than ideal, however, and new ones were adopted. The entire program was in the formative stage at the time of writing, but would doubtless become a vital operation of the Corps of Engineers.

The Corps would work closely with the Environmental Protection Agency (EPA), which concerned itself with water quality standards. The Regional Representative of EPA identified and advised the Corps with respect to applicable water quality stand-

ards. The Regional Director of the National Marine Fisheries Services of the National Oceanic and Atmospheric Administration and the Regional Coordinator or field representative of the Department of the Interior would advise the District Engineer concerning the protection of fish and wildlife.

The entire environmental protection program was complex and really in its formative period as environmental quality control was then envisioned. It involved the states, the Department of the Interior, and the Department of Commerce through its National Marine Fisheries Services as well as the Army Corps of Engineers. A change in policy or regulations of any one of those agencies could affect the programs of the others.²³ It would be sometime before firm policies and procedures could be established.

The third consideration of the Mobile District as it looked toward the 1970's was that of manpower economy. Edward E. Peters, Chief of Manpower Management, received a teletype dated 12 July 1968 which stated that no additional appointments could be made for fulltime permanent employees until strength had been reduced to the employment level of 30 June 1966. This directive was designed to implement Section 201 of the law (PL 90-364) enacted 1 July 1968. Positions could be filled up to 75 per cent of those separated until the stated level of employment was reached. The directive further stated that fulltime temporary appointments must not exceed one year. Part-time employment was also restricted. The law was modified so that manpower was based on quarterly vouchers stating how many positions were allotted.²⁴

Manpower strength as of 30 June 1966 stood at 1,111 fulltime permanent positions assigned to civil projects and 578 assigned to military projects, making a total of 1,689 permanent positions. The third quarter of fiscal year 1970-1971, 1,015 civil positions were allotted. Having farmed out the West Point Dam to the Savannah District and having completed the Mississippi Test Facility by 1968, the Mobile District had already reduced its force somewhat and the manpower restriction would not have created problems had added responsibilities not

been assigned to the District.

During May and June 1970, the Mobile District assumed responsibility for the Jacksonville, Florida, District's military construction. This included contracts, real estate and design. It also included Panama Canal Zone military construction. The District further assumed responsibilities for the Canaveral District, Florida, but did receive 50 spaces along with these duties. As of 1 July 1971 the Canaveral District ceased to exist as such and all responsibilities were assigned to be administered as an area office of the Mobile District. Much of the added responsibility has had to be assumed within existing manpower allotments. This necessitated some reorganization and shifting of personnel to accomplish the workload.

As the Mobile District entered the 1970's, one could detect what appeared to be contradictions in its functions. Proud of its space age accomplishments and the role it has played in the aerospace program, it still has some elements of the lingering past. In April 1971 the paddle-wheel snagboat, *Montgomery*, departed Bender's Shipyard, Mobile, to resume its duties on the Apalachicola-Chattahoochee River system. Commissioned in 1926, it is one of the last of the stern wheel snagboats in operation in the nation. Though completely overhauled and efficient, it had the appearance of a steamboat of the last century. As it navigated the lower Apalachicola River, passing jungle-like swamps and forests, the setting had all the appearance of a hundred years ago.

While the *Montgomery* quietly went about the task of removing snags and other obstructions from the river channels, the Mobile District was busy meeting the requirements of the aerospace program in keeping facilities and projects updated. Two projects facing the District in the future were the Theodore Industrial Park ship channel and a superport in the Gulf of Mexico to accommodate super bulk carriers. The first of those projects had passed the planning stage and, when accomplished, would add much to

Mobile as an industrial city. The latter was only a recommendation that the Corps make a feasibility study of the Alabama-Mississippi coast as a possible site for such a facility. Paul Soros, president of Soros Associates International, Inc., was retained by the U. S. Maritime Administration to make technological studies of prospective sites for offshore terminals. He visited Mobile in April 1971 and indicated much interest in a site off the coast of Alabama.²⁵ Other possible Gulf of Mexico sites are off the coast of Louisiana at the mouth of the Mississippi and off the coast of Texas. The Corps of Engineers is expected to have the final word on the selection of a site. If the Alabama-Mississippi site should be chosen, it would be the largest navigation project thus far for the Mobile District and would cost an estimated one billion dollars.

Such a facility would be designed to handle bulk material such as coal, chemicals, iron and basic ores used to manufacture aluminum. It would enable the United States to compete with other nations, such as Japan, which are already using the super bulk carriers. The prospect for the Mobile District Corps of Engineers getting the responsibility for construction of the Gulf of Mexico terminal, if such is accomplished, was greatly enhanced by the Tennessee-Tombigbee Waterway projects.

As the history of the Mobile District is reviewed, evidence of the initial beginnings is clearly seen in the coastal fortifications which still stand in various degrees of preservation. Step by step the Corps has met the demands made upon it both in peace and war and has accomplished its responsibilities. Tremendous capability and technological know-how have been acquired through the years and have never been greater than at present. As the military, industrial, navigation, and other requirements are made, there is every indication that the Corps will rise to the demands.

Chapter I

- 1 Joseph G. Swift to William H. Crowford, Secretary of War, Engineering Department, Misc. Letters Sent, I, 5-6 (Engineering Department is hereafter abbreviated E.D.)
- 2 Cullum's *Register* I, 61.
- 3 Cullum's *Register* I, 65-66.
- 4 Forest G. Hill, Roads, Rails and Waterways, 8ff.
- 5 Corps of Engineers Report Book, 3 July 1812-4 October 1823, Report no. 112, 208ff. This report and portions of it were disseminated widely and has appeared in a number of places, including the Board of Engineers Report Book. Both are in the National Archives.
- 6 Simon Bernard, *Board of Engineers Report Book*, dated 23 December 1817, in National Archives.
- 7 James Gadsden, Report dated 11 October 1821, report 140 in Corps of Engineers Report Book, 3 July 1812-4 October 1823, National Archives.
- 8 Copy of the chart on file in Drafting Department, Corps of Engineers, Mobile District. See also Bernard to Chief Engineer, 19 September 1825, in *American State Papers: Military Affairs* V. III, 158, 159.
- 9 *American State Papers, Naval Affairs* V II, 110, 111. See also Macomb to James T. Barbour, Sec. of War, *Ibid.*, V III, 158.

Chapter II

- 1 *American State Papers: Military Affairs*, V.I., 859.
- 2 *Ibid.*, V.2, 628.
- 3 Captain Rene DeRussy to Colonel William K. Armistead, 12 May 1821 in Letter Book, Document 1237, in National Archives, Federal Records Center, East Point, Georgia. All other letters cited in this chapter are from the same source. They appear in the book by date sent.
- 4 For information on the Dolive family see Florence Dolive Scott, Daphne, 3ff. Dominique Dolive was an early settler of the eastern shore of Mobile Bay. His son, Louis, and son-in-law, Nicholas Weeks rendered valuable service to the Corps of Engineers.
- 5 DeRussy to Armistead, 26 May 1828.
- 6 DeRussy to Alexander Macomb, 24 September 1821.
- 7 DeRussy to Macomb, 18 October 1821.

- 8 DeRussy to Macomb, 18 December 1821.
- 9 *American State Papers: Military Affairs*, V.s., 826-833. This document includes most of the facts discovered about the work on Dauphin Island, including reports of witnesses called by the commission headed by Swann.
- 10 Report by Colonel Armistead, 30 November 1819. Report 834 in Reports of the Corps of Engineers. National Archives.
- 11 Armistead to John C. Calhoun, Secretary of War, 10 February 1821, in *American State Papers: Military Affairs*, V. II, 349. See also p. 49.
- 12 Fort Morgan Voucher Book, p. 27, National Archives, Federal Records Center, East Point, Georgia.
- 13 DeRussy to Armistead, 12 May 1821.
- 14 DeRussy to Armistead, 6 June 1821.
- 15 DeRussy to Lt. H. C. Story, 8 June 1821.
- 16 DeRussy to Macomb, 1 January 1823.
- 17 Ogden to Macomb, 27 December 1825.
- 18 Ogden to Macomb, 8 April 1827.
- 19 Ogden to Macomb, 25 April 1826.
- 20 Voucher Book and daily reports of the construction of Fort Morgan, Document 1237. See also Document 1266 also at Federal Records Center, East Point, Georgia. Those Documents provide rather complete record of construction progress.
- 21 Captain William H. Chase to General Charles Gratiot, 24 May 1834.
- 22 Report, dated 31 August 1837, Fort Morgan, Alabama, National Archives R. G. 77, Document B. 2988, Box 17.
- 23 Chase to Colonel Joseph G. Totten, 19 March 1839, R. G. 77 C. 278, Box 40.

Chapter III

- 1 Alexander Macomb to Secretary of War, 16 February 1826, in *American State Papers*, V. III, 243.
- 2 *Ibid.*, 243.
- 3 Chase to Charles Gratiot, Chief Engineer, 1 March 1829, in Chase letter Book in National Archives,

Chapter IV

- RG 77, 147. Before the year was out Underhill had died, and Strong continued alone. Letters hereinafter cited from the same source unless otherwise stated.
- 4 Chase to Gratiot, 1 July 1829.
 - 5 Chase to Gratiot, 1 October 1829.
 - 6 Chase to Gratiot, 29 November 1829.
 - 7 Chase to Gratiot, 1 December 1829.
 - 8 Chase to Gratiot, 19 April 1830.
 - 9 Chase to Gratiot, 1 March 1830.
 - 10 Chase to Gratiot, 12 August 1831, dated Stanton, Virginia.
 - 11 Chase to Gratiot, 30 September 1831, dated Philadelphia.
 - 12 Chase to Gratiot, 30 May 1833.
 - 13 Chase to Gratiot, 13 May 1833.
 - 14 Chase to Gratiot, 24 September 1833.
 - 15 Chase to Gratiot, 25 March 1835.
 - 16 Annual Report, 1834, Senate Document 266, V. I., 104, 105.
 - 17 Chase to Gratiot, 31 July 1835.
 - 18 Chase to Gratiot, 24 March 1835.
 - 19 Annual Report, 1835, Senate Document 271, V. I., 100.
 - 20 *Ibid.*, 103, 104.
 - 21 Annual Report, 1836, Senate Document 297, V. I., 194.
 - 22 Annual Report, 1837, Senate Document 314, V. I., 288.
 - 23 Annual Report, 1839, Senate Document 354, V. I., 354.
 - 24 *American State Papers: Naval Affairs* V. II, 110, 111.
 - 25 Annual Report, 1844, Senate Document 449, V. I., 182.
 - 26 Annual Report, 1845, Senate Document 470, V. I., 259.
 - 27 Cullum's Register V. I., 142.
 - 1 Annual Report, 1839, Senate Doc., 351, V. I. 157ff.
 - 2 Annual Report, 1840, Senate Doc., 375, V. I. 99.
 - 3 *Ibid.*, 105.
 - 4 Annual Report, 1842, Senate Doc., 413, V. I. 237.
 - 5 Annual Report, 1845, Senate Doc., 470, V. I., 277, A sap is a trench dug from within a trench. A sapper, then, was one trained to dig such trenches. Miners were employed to dig away foundations or to ruin by undermining or secret means.
 - 6 Annual Report, 1850, Senate Doc., 587, V. I., 342ff.
 - 7 Annual Report, 1846, Senate Doc., 493, V. I., 128.
 - 8 Annual Report, 1847, Senate Doc., 503, V. I., 616.
 - 9 Annual Report, 1850, Senate Doc., 547, V. I., 342ff.
 - 10 Annual Report, 1855, Senate Doc., 811, V. I., 190ff.
 - 11 Annual Report, 1844, Senate Doc., 449, V.I., 183. See also *American State Papers: Military Affairs*, V.I., 859.
 - 12 Cornelius A. Ogden to George J. Witchel, 18 March 1849, in Fort Morgan Letter Book V. 2, Federal Record Center, East Point, Georgia.
 - 13 Jeremiah M. Scarritt to Totten, 14 December 1847, in Fort Morgan Letter Book.
 - 14 Scarritt to Totten, 6 January 1848, 4 December, Box 2, Land Papers. See also A.B. Week to Scarritt, 25 May 1848, 5 December, Box 2 and Annual Report, 1848, Senate Doc. 537, V.I., 268.
 - 15 Danville Leadbetter to Totten, 3 December 1853, 26 December, Box 2, Land Papers. See also Annual Report, 1854, Senate Doc., V.I., 171.
 - 16 Fort Gaines-Journal of Operations, February 1857- February 1860. 28 February 1857 entry. No pagination. All entries by date only.
 - 17 Ogden to Totten, 7 March 1842, in Land Papers, Box 2.
 - 18 Percy Walker to Rene DeRussy, 12 October 1859, in Land Papers, Box 2.
 - 19 DeRussy to John B. Floyd, Secretary of War, 16 March 1860, in Land Papers, Box 2.
 - 20 Annual Report, 1858, V. III, 184.
 - 21 Annual Report, 1857, V. III, 184ff.

- 22 Annual Report, 1848, Senate Doc. 537, V.I. 247.
- 23 Annual Report, 1851, Senate Doc. 611, V. I. 355.
- 24 Annual Report, 1855, Senate Doc. 811, V. I. 190.
- 25 Annual Report, 1858, V. III, 825.
- 26 Annual Report, 1860, V. II, 649.
- 27 *Ibid.*, 649.
- 28 Annual Report, 1861, V. II, 103.
- 29 *Ibid.*, 103.
30. *Ibid.*, 94ff.

Chapter V

- 1 Henry P. Beers, "A History of the U.S. Topographical Engineers, 1813-1863," In *The Military Engineer*, XXXIV, No. 202, June 1942, 287ff. Beer gives a brief history of the Topographical Engineers until they were placed under the Corps of Engineers in 1863.
- 2 Annual Report, 1824, Senate Doc. 113, V. I, 59.
- 3 *Ibid.*, 60.
- 4 Annual Report, 1825, Senate Doc. 131, V.I, 5.
- 5 *Ibid.*, 52, 81.
- 6 *Ibid.*, 55.
- 7 Annual Report, 1827, Senate Doc. 163, V.I, 61.
- 8 *Ibid.*, 53.
- 9 Annual Report, 1828, Senate Doc. 184, V.I, 40.
- 10 Chase to Gratiot, 1 May 1829.
- 11 Annual Report, 1830, Senate Doc. 203, V.I, 95.
- 12 Chase to Gratiot, 17 August 1830.
- 13 Chase to Gratiot, 3 Dec. 1834. See also, Annual Report, 1834, Senate Doc. 266, V.I, 109.
- 14 Chase to Gratiot, 25 March 1835. See also Annual Report, 1835, Senate Doc. 297, V.I, 108.
- 15 Chase to Gratiot, 1 April 1835.
- 16 Annual Report, 1837, Senate Doc. 314, V.I, 297.
- 17 Annual Report, 1836, Senate Doc. 297, V.I, 212.
- 18 Annual Report, 1838, Senate Doc. 338, V.I, 182.

- 19 Annual Report, 1839, Senate Doc. 351, V.I, 157.
- 20 Annual Report, 1840, Senate Doc. 375, V.I, 99.
- 21 Annual Report, 1844, Senate Doc. 449, V.I, 283.
- 22 Annual Report, 1853, Senate Doc. 691, V.I, 219.
- 23 Peter J. Hamilton, *Mobile of the Five Flags*, 214.
- 24 *Ibid.*, 212.
- 25 Cyril E. Cain, *Four Centuries on the Pascagoula*, 41ff.
- 26 Annual Report, 1827, Senate Doc. 163, V.I, 53.
- 27 Chase to Gratiot, 17 August, 1830.
- 28 Annual Report, 1830, Senate Doc. 203, V.I, 96.
- 29 Annual Report, 1834, Senate Doc. 266, V.I, 110. See also Annual Report, 1835, Senate Doc. 279, V.I, 109.
- 30 Annual Report, 1836, Senate Doc. 279, V.I, 207.
- 31 Annual Report, 1837, Senate Doc. 341, V.I, 97.
- 32 Annual Report, 1852, Senate Doc. 659, V.I, 62, and 1855, Senate Doc. 811, V.I, 265.
- 33 Annual Report, 1827, Senate Doc. 163, V.I, 53.
- 34 Annual Report, 1833, Senate Doc. 238, V.I, 79.
- 35 Annual Report, 1835, Senate Doc. 279, V.I, 108.
- 36 Jeremiah M. Scarritt to Joseph G. Totten, Mobile, 6 January 1848, in Fort Gaines Land Papers, Box 2, National Archives.
- 37 Peter J. Hamilton, *Mobile of the Five Flags*, 251, 273.
- 38 Mobile Press-Register, 16 August 1964..

Chapter VI

- 1 *Annual Report*, 1871, V. I. 563.
- 2 Captain S. P. Gray to the Mobile Public Library 20 November 1965 in River Boat file.
- 3 Log book of the *City of Mobile* under date 25 September - 1 October 1912, on file in Mobile Public Library.
- 4 *Montgomery Advertiser*, 7 August 1966, 576, 77.
- 5 *Annual Report*, 1872, V. I. 62ff
- 6 *Annual Report*, 1873, V. I. 692ff.

7 *Annual Report*, 1877, V. I. 69, 407-9.

8 *Annual Report*, 1880, V. I. 1050, 51.

9 *Annual Report*, 1902, V. I. 293,3.

10 *Annual Report*, 1914, V. I. 683.

11 *Annual Report*, 1917, V. II. 2473.

12 *Annual Report*, 1872, V. I. 615, 16.

13 *Annual Report*, 1871, V. I. 504, 572.

14 *Annual Report*, 1873, V. I. 698ff.

15 *Annual Report*, 1876, V.I. 73.

16 *Annual Report*, 1874, V. I. 895.

17 *Annual Report*, 1913, V. II. 2171.

Chapter VII

1 *Annual Report*, 1864, 38ff.

2 *Ibid.*, 35ff.

3 Voucher Book and daily reports of the construction of Fort Morgan, Document 1237. See also Document 1266, Those documents are filed at the Federal Records Center, East Point, Georgia. Other reports come from the same source. They are identified by date in the documents rather than by page numbers.

4 *Annual Report*, 1833, V. I., 42.

5 *Annual Report*, 1884, V. I., 5ff.

6 *Annual Report*, 1887, V. I., 8, 9.

7 *Annual Report*, 1900, V. I., 5-6.

8 Manuscript signed by E. M. Weaver, Chief of Coastal Artillery District of Pensacola, dated 23 July 1912, Documents 1279. Box 555, National Archives, East Point, Georgia. See also "Self-Guided Tour, Fort Pickens" Published by the Florida Board of Parks. All the information concerning the batteries at Fort Pickens and Fort McRee are secured from these two documents. Weaver noted all the defense facilities at Pensacola Harbor.

9 *Annual Report*, 1897, V.I., 722-725.

10 Proceedings of a board of officers under Special Orders No. 2, dated 12 April 1917, Headquarters, South Atlantic Coast Artillery District. Meeting dated, Fort Morgan, 'uly 1917.

11 *Annual Report*, 1898, V. I., 739-45.

12 Map showing projected and completed works. Fort Gaines, dated 21 November 1902, on file, Corps of Engineers Drafting Office, Mobile, Alabama.

13 William C. Endicott to Sibley and Sibley, General Manager of the Mobile and Gulf Telephone Company, no date, Box 2, Land Papers, Fort Morgan Reservation. National Archives. All information concerning the telephone company came from documents in Box 2.

14 Damrell to Chief of Engineers, Document 11, Land Papers, Box 2, National Archives.

15 Curry, Chief of Engineers to Redfield Proctor, Secretary of War, 16 February 1891, Document 112, Land Papers, Box 2. Curry reviewed the conditions under which the station was established.

16 Thaddeus McNulty to Lewis C. Grant, Assistant to the Secretary of War, 1891, Document 112, Land Papers, Box 2.

17 Record of the Engineering Department, dated 11 May 1891, Land Papers, Box 2.

18 General Order No. 16, War Department, 22 January 1906. Transaction recorded in Record Book 9 N. S. pages 562-567. Probate Records Baldwin County, Alabama.

Chapter VIII

1 L. L. Knight, *The Mobile District Reorientation to the Space Age*, 1963, published by the U.S. Army Corps of Engineers, Mobile District, 5.

2 *Annual Report*, 1828, Senate Document 184, V. I., 40.

3 *Annual Report*, 1827, Senate Document 163, V. I., 53.

4 *Annual Report*, 1876, V. I., 508.

5 *Ibid.*, 513

6 *Ibid.*, 512.

7 William L. Dolive, "Gulf Intracoastal Waterway", Ms. report on file in Technical Liaison Office, Mobile District, 1950, 4.

8 Dolive, *Op. Cit.*, 4

9 U. L. Perry, Unnamed Ms. report on file in Technical Liaison Office. Mobile District, 1950, 2.

10 Dolive, *Op. Cit.*, 3.

11 I. L. Campbell, "The Gulf Intracoastal Waterway: Northwest Florida Section," Ms. report on file in

the Technical Liaison Office. Mobile District, 1950, 4.

12 *Ibid.*, 5.

13 *Ibid.*, 5-8.

14 Perry, *Op. Cit.*, 5.

15 Dolive, *Op. Cit.*, 5.

16 *Annual Report*, 1939, 807-8

17 *Ibid.*, 809-10.

18 *Annual Report*, 1942, Pl. V.I., 703.

19 Knight, *Op. Cit.*, 8, 9.

20 *Ibid.*, 9.

Chapter IX

1 Maurice Matloff, General Editor, *American Military History*: Office of the Chief of Military History, U. S. Army, Washington, D. C., 1969, p. 419.

2 L. L. Knight, *The Mobile District Reorientation to the Space*, 1815-1963, ms. 1963, pp. 9, 10.

3 *Ibid.*, 10ff.

4 R. L. Saylor, *Historical Sketch of the Mobile Engineer District*, A Special Report, January 1944, p. 6.

5 L. L. Knight, interview December 28, 1971, Knight was present in Pensacola when the lifeboats were towed in and witnessed the unloading. He also gave much other information drawing from his 32 years of employment with the Mobile District. He retired in 1970 from the position, Chief, Military Branch of the Engineering Division.

6 A. J. Chamberlin, Manuscript on file in Technical Liaison Office, Mobile District. For a biographical sketch of the career of Colonel Worsham see *Safety Beacon*, Mobile District Office, September, 1941, V.XI, No. 1, p. 3.

7 "Port of Mobile News and Shipper's Guide," Mobile, Alabama State Docks and Terminals, Mobile September 1945, p. 7.

8 *Safety Beacon*, V. XI., No. VI, March 1942.

9 *Port of Mobile News*, September 1945, pp. 6, 7.

10 L. L. Knight, Interview, December 29, 1971.

11 Lists of military projects on file in Record Branch. One list dated 1946 includes all World War II

projects. Another dated 1950 lists the permanent installations as of that date. Since that time some additional have been added and others considered permanent, such as Brookley, have closed.

12 George Collier, retired, Chief, Mechanical Section, Design Branch, Engineering Division, interview January 1, 1972. Also L. L. Knight interview 29 December 1971.

Chapter X

1 *History of Mobile District, Corps of Engineers Relating to The Current Mobilization Period*, types MS on file in Technical Liaison Office, Mobile District, dated 1951. This history was compiled at the request of the Office of Chief of Engineers. The purpose of the project was to supply the central office with a summary which would be made available to historians of the Office of the Chief of Military History to be used in compiling a history of the Korean conflict.

2 *Ibid.*, 1.

3 *Ibid.*, 3ff.

Chapter XI

1. Robert L. Roshold, *An Administrative History of NASA, 1958-1963*, National Aeronautics and Space Administration, 1966, p. 7.

2. *U. S Army Engineer District: Mobile Corps of Engineers Mississippi Test Facility*. Special Report, 1966, p. 1. Report on file in Technical Liaison Office, Mobile District.

3. *Picayune Item*, Picayune, Mississippi, 19 January 1963.

4. *Picayune Item*, 16 May 1963.

5. *Mobile Press Register*, 6 January 1963.

6. *Ibid.*

7. *Picayune Item*, 28 March 1963.

8. *Picayune Item*, 19 March 1964.

9. *Picayune Item*, 20 June 1963. See also 11 April 1963.

Chapter XII

1 Lt. R. L. Saylor, "Historical Sketch of the Mobile District," typed ms, January 1944, on file in Technical Liaison Office.

2 *Annual Report*, 1942, Part I., V. I., 703.

- 3 *Water Resources Development by the U. S. Army Corps of Engineers in Alabama*, printed by the U. S. Engineers South Atlantic Division, 1 January 1967.
- 4 *Ibid.*, p. i.
- 5 L. L. Knight, *The Mobile District Reorientation to the Space Age*, Mobile, 1963, p. 19, 20.
- 6 *Ibid.*, p. 13.
- 7 *Project Maps, Mobile District*, Office of the District Engineer, Mobile, 1969, Sheets 6-1, and 6-7. This source contains a statement of size, cost, purpose, and state of completion of each project.
- 8 *Recreation: Civil Works Projects*, Corps of Engineers, Department of the Army, no date, but information given goes through 1969, p. 35.
- 9 *Flood Plain Information: Pascagoula-Gautier Coastal Area, Jackson County, Mississippi*. Corps of Engineers, U. S. Army, Mobile District, 1970. The Reports of the other studies mentioned are on file in the Mobile District Library.
- 10 For a list of floating plants, see *U. S. Government Moorings, Floating Plant, and Boat Yard*, U. S. Army Engineer District, Mobile Corps of Engineers, Mobile, 1971.
- 11 *Mobile Press-Register*, 27 December 1964.
- 12 L. L. Knight, *The Mobile District Reorientation to the Space Age*, 23.

Chapter XIII

- 1 The history of Camille and facts about the storm have been recorded in a number of publications. See: Department of the Army, Corps of Engineer District Mobile publications *Hurricane Camille: After Action Report*, 1970; *Report on Hurricane Camille*, May, 1970; Office of Emergency Preparedness, *Hurricane Camille: 4 Months of Action*, December 1969; *8 Months After Camille: The Coast and the Virginias*, April 1970; and *Federal Response to Hurricane Camille* (Part I) Hearings before the Special Subcommittee on Disaster Relief, U. S. Printing Office, Washington: 1970.
- 2 "Camille at Columbia" In *Weatherwise*, October 1969.
- 3 *Report on Hurricane Camille: 14-22 August 1969*, Corps Report May 1970, 22, 23.
- 4 Colonel Harry A. Griffith, Briefing for the Chief of Engineers entitled "Mobile District's Hurricane Camille Activities," October 1970.

- 5 Interview with Walter C. Knox, Chief, Construction Division, 13 August 1970.
- 6 *Hurricane Camille: 4 Months of Action*, 12, 13.
- 7 *Ibid.*, 13.
- 8 Colonel Griffith, "Briefing," 1970, 9, 10.
- 9 *Ibid.*, 3, 4.
- 10 *Ibid.*, 15, 16.
- 11 *Ibid.*, 11.
- 12 *Ibid.*, 13.
- 13 For list of Temporary Duty Personnel borrowed from other Districts see *Hurricane Camille: After Action Report*, February 1970, Exhibit 7-2, pages 1-4.

Chapter XIV

LOOKING INTO THE FUTURE

- 1 William H. Stewart, Jr., *The Tennessee-Tombigbee Waterway*, I. Stewart cites W. A. Evans, but did not indicate the source of Evans' information. He did say that the Marquis de Montcalm advised Louis XV about 1760 or 1770 concerning the need of such a waterway. Montcalm died in the Battle Of Quebec in September 1759, and all French territory East of the Mississippi River and all of Canada was ceded to England in 1763. France could have had no interest in the waterway after that date. James H. Stone, *Cotton Gin Port*, 10, also mentions a French scheme to connect the Tennessee and Tombigbee.
- 2 *Ibid.*, 1.
- 3 *Simon Bernard Board of Engineers Report Book*, dated 23 December 1817, in National Archives.
- 4 Stewart, *The Tennessee-Tombigbee Waterway*, 1.
- 5 E. Merton Coulter, *Georgia: A Short History*, 253ff.
- 6 Stewart, *The Tennessee-Tombigbee Waterway*, 2.
- 7 *Ibid.*, 2.
- 8 There are numerous descriptions of the proposed project. For a less technical description see the *Mobile Press Register*, 18 November 1956,
- 9 Alabama, *Journal of the Senate*, 1945 Regular Session, 1, 180-181. See also *Journal of the House* 1945 Regular Session 1, 405.

- 10 House Document 486. Also recorded in River and Harbor Act of 1946 (Public Law 525, 79th Congress, 2nd Session 24 July 1946.)
- 11 Congressional Record, 76th Congress, 3rd Session 1940, LXXXVI, Part 5, 4953.
- 12 Congressional House Committee on Rivers and Harbors, *Hearings on the Improvement of Waterway Connecting the Tennessee and Tombigbee Rivers, Alabama, Mississippi*, 77th Congress, 1st Session 1941, 102.
- 13 Congressional Record, 78th Congress, 2nd Session, 1944, XC Part 2, 2767 and Part 3, 2927-28.
- 14 Tuscaloosa News (Tuscaloosa, Alabama) 26 April 1940.
- 15 Congressional Record, 79th Congress, 1st Session, 1945, XCI, Part 1, 531.
- 16 The Mobile Register, 26 May 1971.
- 17 Congressional Record, 79th Congress, 2nd Session, 1946, XCII, Part 5, 6405-6413.
- 18 Ibid, pp. 8316-8322.
- 19 Mobile Register, Saturday, 10 April 1971.
- 20 William O. Douglas, *The Corps of Engineers: The Public Be Damned*, cited in Walt Anderson, editor, *Politics and Environment*, Pacific Palisades, California, 1970, 268-284. The article first appeared in *Playboy Magazine*, July 1969.
- 21 *Environmental Guidelines for the Civil Works Program of the Corps of Engineers*, Institute for Water Resources Report, 70-5, November 1970, 4.
- 22 Interview with E. A. Drago, Chief, Environment and Resources Branch, Mobile District, Corps of Engineers, 12 April 1971.
- 23 Interview with T. O. Gaillard, Chief of the Operations Division, 18 May 1971. See also *Permits for the Discharge or Deposits into Navigable Waters: Part II and Part III*, 1971 Preliminary Edition, Department of the Army Corps of Engineers.
- 24 Interview with Edward E. Peters, Chief, Manpower Management Branch, 12 April 1971.
- 25 Press Register, Mobile, Alabama 17 April 1971.

APPENDIX

ENGINEERS IN CHARGE OR DISTRICT ENGINEERS

MOBILE DISTRICT

MAJ C. B. Reese	1870-1870	COL R. S. Thomas	1919-1920
CPT A. N. Damrell	1870-1870	MAJ Earl North	1920-1924
COL J. H. Simpson	1870-1872	MAJ T. H. Emerson	1924-1928
LTC W. F. Reynolds	1872-1873	LTC W. D. A. Anderson	1928-1932
CPT, MAJ & LTC A. N. Damrell	1873-1895	LTC R. S. Thomas	1932-1935
1LT Eben E. Winslow	1895-1895	CPT F. Z. Pirkey	1935-1936
MAJ W. T. Rossell	1895-1901	COL Richard Park	1936-1940
CPT Spencer Cosby	1901-1903	LTC Willis E. Teale	1940-1941
CPT & MAJ W. E. Craighill	1903-1906	LTC L. D. Worsham	1941-1942
CPT J. B. Cavanaugh	1906-1906	LTC Doswell Gullatt	1942-1943
MAJ W. E. Craighill	1906-1906	LTC H. I. Collins	1943-1945
MAJ Henry Jervey	1906-1910	COL Mark M. Boatner, Jr.	1945-1947
MAJ & LTC C. A. F. Flagler	1910-1913	COL J. J. Twitty	1947-1949
CPT R. T. Ward	1913-1913	COL W. K. Wilson, Jr.	1949-1952
LTC Charles Keller	1913-1916	COL Harry L. Fox	1952-1954
MAJ W. L. Guthrie	1916-1916	COL Harold E. Bisbort	1954-1958
MAJ F. C. Boggs	1916-1916	COL Robert W. Love	1958-1961
LTC Edward H. Schulz	1916-1916	LTC & COL Daniel A. Raymond	1961-1964
MAJ W. L. Guthrie	1916-1917	COL Robert C. Marshall	1964-1967
CPT C. L. Sturdevant	1917-1917	COL Robert E. Snetzer	1967-1970
Mr. G. K. Little	1917-1918	COL & BG Harry A. Griffith	1970-1973
Mr. F. H. Reed	1918-1919	COL Drake Wilson	1973-

MONTGOMERY DISTRICT

(Consolidated with Mobile District on 1 October 1933)

CPT R. L. Hoxie	-1889	MAJ Frank C. Boggs	1916-1916
CPT Philip M. Price	1890-1894	CPT C. L. Sturdevant	1916-1917
MAJ F. A. Mahan	1896-1899	Mr. James E. Turtle	1918-1918
CPT C. A. F. Flagler	1899-1900	COL W. D. A. Anderson	1919-1919
CPT W. V. Judson	1901-1901	MAJ W. A. Johnson	1919-1921
CPT R. R. Raymond	1902-1902	MAJ J. J. Loving	1921-1924
CPT J. B. Cavanaugh	1903-1907	MAJ E. A. Bethel	1924-1926
CPT H. B. Ferguson	1908-1910	MAJ L. E. Lyon	1926-1930
LTC G. D. Fitch	1911-1912	MAJ R. A. Sharrer	1930-1933
MAJ Earl I. Brown	1913-1915		

